

Marine Review

SHIP OPERATION

SHIPBUILDING

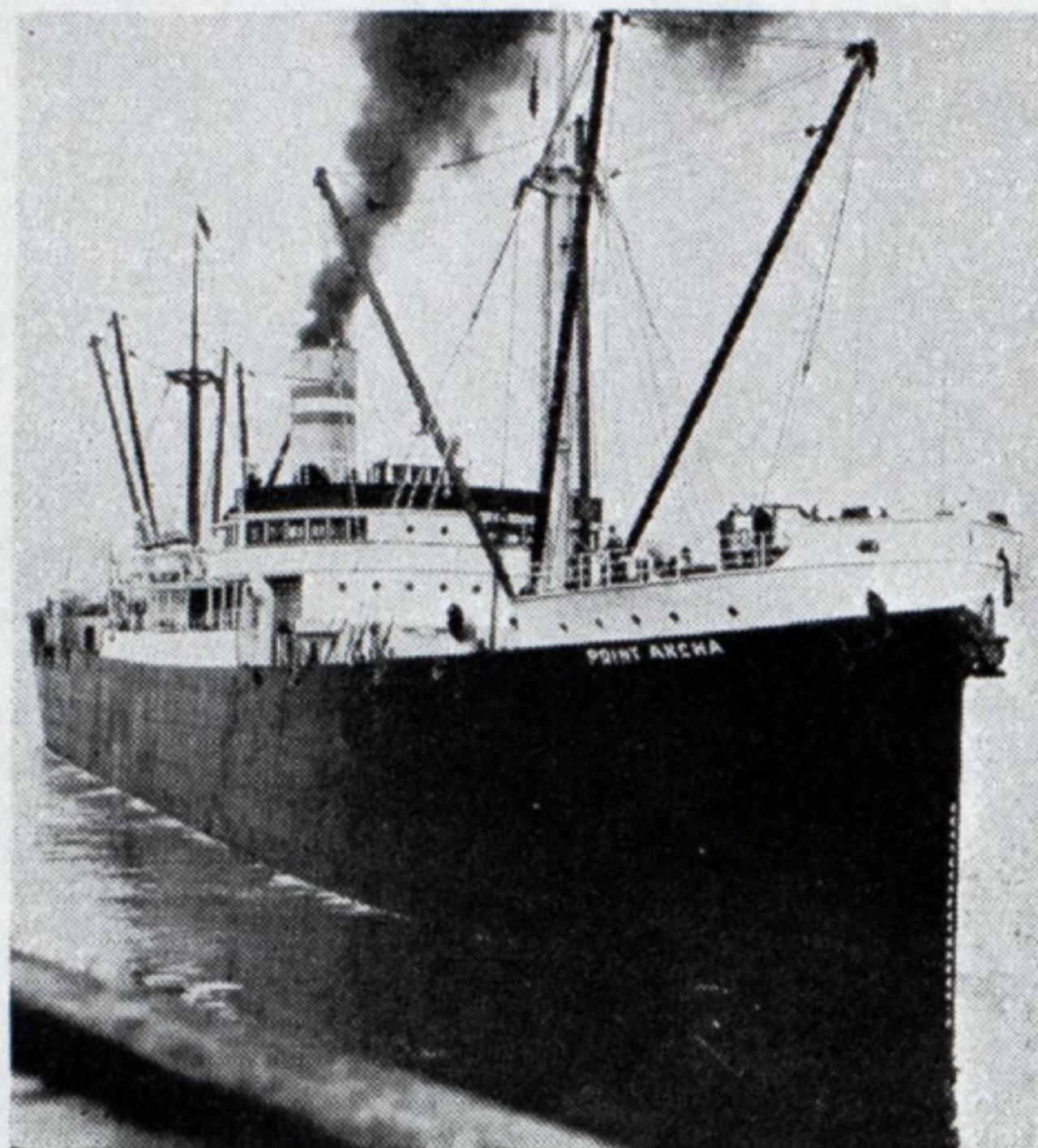
CARGO HANDLING

The National Publication Covering the Business of
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Prompt Action is Urgent on Ship Subsidy Bill

CONFIDENCE and the incentive to carry out long delayed plans for new tonnage and improvement and expansion of services await action by the present congress on legislation along the lines of the President's message on shipping. The importance of a prompt and favorable decision cannot be overestimated. An official of the government and one of its advisors in shipping matters, has publicly stated that 24 general cargo and passenger vessels and 18 high speed tankers will be laid down if the proposed ship subsidy legislation is passed. He has also said that if the mail contracts are cancelled, without providing aid in some other form, many American ocean going lines will be compelled to abandon their services.

Fortunately, the responsibility for preparing this legislation has been met in a very effective manner by Senator Copeland of New York and Congressman Bland of Virginia. Both thoroughly appreciate the importance to our national welfare of a strong American merchant marine to promote commerce and to aid national defense. From long study and close contact with maritime affairs, both understand the problems involved.

As a result, the committees, of which they are chairmen, have prepared a bill on shipping introduced by Senator Copeland, April 15.

Under the terms of this bill a board is to be created to be known as the United States maritime authority, to be composed of five members selected for special fitness and with long tenure of office, ultimately seven years. This maritime authority will study all national maritime problems. It will collect and analyze data and develop plans for construction and efficient operation of vessels. It will determine the amounts of financial aid to be paid under the law in the building and operation of ships in foreign trade. It will rule the merchant marine under wide powers. And it will be its

specific duty to be concerned about, and have something to say as to how, the business of those receiving government aid is conducted.

An office of maritime affairs is to be established in the department of commerce to be headed by an assistant secretary, to be known as assistant secretary of commerce for maritime affairs. This officer will control and supervise all administrative activities in connection with the navigation laws, the inspection, construction, equipment and manning of vessels, aids to navigation, and any other duties relating to the merchant marine, now exercised by the department of commerce.

The maritime authority and the interstate commerce commission are to co-operate to foster and preserve both rail and water transportation. A joint transportation board is to be created to make recommendations to the authority and the commission with reference to the inter-relation of rail and water traffic to further the development of both.

Training for seamen and the use of continuous discharge books is a strong feature of the bill.

If the main provisions of this bill are retained, it should prove an effective stimulus to shipping and shipbuilding since both operating and building costs will be on a parity with foreign competition.

It would be preferable for quick and decisive action to have the maritime authority composed of three members instead of five. The proposed legislation is perhaps longer and more involved than need be.

Many difficult administrative problems will arise and their sound and efficient handling will depend on the quality of personnel selected and the singleness of responsibility allowed. Narrow bureaucratic interpretation of the law will defeat the ends sought.

Is the government in its executive and legislative branches prepared to support a broad intelligent administration, impervious alike, to political or private influence, favor or displeasure? It is in this spirit and this spirit alone that we can hope successfully to administer an act of this kind.

FOREIGN SHIPPING,

Recovery Steady, Upward Trend Gradual

BY FRANK C. BOWEN

INCREASE in cargo business for European shipping is continuing steadily, although the improvement is slow and the acceleration that was confidently expected when things had begun to move has not yet taken place. There is undoubtedly a larger volume of cargo to be moved, and ships on regular berth are, in most trades, doing appreciably better.

On the other hand there has not been the general and continuous upward trend of tramp freights for which everybody is waiting and without which the shipping revival cannot be said to be anything like complete. The increase in the tramp's business has not been as conspicuous as in that of the liner's and what there has been has mostly been at drastically cut prices so that it has gone to the cheapest run ships, although British interests seem to have succeeded in establishing minimum freights in the River Plate, St. Lawrence and Australian trades.

Passenger Trade Improvement

In the passenger trade the King's silver jubilee year is expected to make an appreciable difference in Britain; even shorn of a lot of its ceremony the program is an attractive one and the passenger companies on imperial routes — India, Australia and South Africa — are booked to capacity. Yachting cruises, especially those designed for the passenger of moderate means and short holiday, are also booking up well. The Atlantic season should show a further improvement but it is anticipated that the United States lines, with its popular MANHATTAN and WASHINGTON, and the continental lines with their record breakers, will benefit most this year.

The British tramp ship subsidy scheme, reversing the policy of 80 years, has been launched but up to the time of writing little progress appears to have been made. A strong committee has been appointed, men of the highest reputation with fine experience in the shipping business, and whether the careful examination of all claims for help has checked the desire, or whether it has met unexpected difficulties, is a matter of

A quarterly review of European shipping. The first article for this year appeared in February. The third and fourth articles will appear in the August and November issues respectively.

doubt. There is no doubt, however, that it is very difficult to frame any scheme of state assistance that shall be only temporary in its application as is the desire of practically every reputable British shipowner. The great danger, foreseen in the first place and made amply clear since the definite proposal has been put forward, is that the subsidy will become permanent which is desired neither by the taxpayer nor the shipowner.

Scrap and Build Plan

It being realized that some move was necessary in order to save British shipping, the actual subsidy has gone through quietly, but the £10,000,000 loan for new construction, on condition that double the tonnage is broken up, is another matter. It has been very bitterly criticized indeed, and the critics have a good deal of precedent to work upon in their experience of the trades facilities acts which gave certain companies the opportunity of over-building at public expense. On the other hand, there is no denying that a large proportion of the British ships now laid up in the various ports can never hope to go to sea again in competition with up to date vessels under other flags.

It is quite useless to argue that the British have some up to date vessels too; if we are to maintain our position the general standard has to be high and it would appear to be that the scrap-and-build policy is the only means of contriving it. No shipowner appears yet to have made the definite move but there is no doubt that some will in the near future, for recent dealings on the old ship market, where the price is steadily creeping up, show that various interests are preparing to carry out the stipulations as to scrapping.

Study Safety at Sea

Another matter in which the British government has had to take a hand is in the safety of ships at sea. The number of British cargo ships which have recently foundered has caused some alarm in the country, the more so as many people are under the totally mistaken impression that these ships have recently had their Plimsoll marks, a name to conjure with in dealing with the British public drastically altered.

This public uneasiness has unfortunately given the opportunity of

making safety at sea a political matter and there has been a good deal of political rancor shown in the house of commons, backed by wild statements. The Socialist party want to use the incidents to further its claim for bigger crews and improved working conditions but unfortunately their intemperate statements to support the claim have done more harm than good. The authorities, who let the matter become serious by unfortunate but not unexpected delays, have now ordered a special wreck inquiry under Lord Merrivale, probably the best man in the country for such a job, and under his practical guidance it is likely to produce useful results with regard to the steering gear which has so often failed, hatch covers which collapse, and a number of other points which really require investigation.

Before these notes appear again the Compagnie Generale Trans-Atlantique's giant liner NORMANDIE will be on service and a good many questions which are now exercising the minds of shipping men will probably be settled. To what extent will the company prove to be justified in adopting the revolutionary Yourkowitch hull? Will she be able to gain the Atlantic blue riband from its present Italian holders, and if so by what margin? And will she be able to retain it when the Cunard White Star liner QUEEN MARY enters service next year?

Normandie Costly to Build

From a technical point of view the NORMANDIE is much more interesting than the rival Cunarder, but her chances of showing a profit are much more remote for it is reckoned that she has cost nearly twice as much to build. In her case, however, the French government is behind the owner, not so much to give them a chance of profit but to attract American tourists to the northern route; the manner in which large numbers have been traveling by the Italian ships since they won the blue riband has had a serious effect on the French tourist business.

On the question of her value a curious, and it must be admitted unsatisfactory, position has been reached with regard to her insurance, a large part of which is covered on the London market. Little more than a quarter of her value has been covered on the ground that the in-

Trend of Trade and Shipping in British Isles

	January	February	Two months ended Feb. 28, 1935	1934
Total entrances of cargo ships into British ports:				
Number of vessels	3,514	3,263	6,777	6,825
Tons	4,564,037	4,220,411	8,784,448	9,064,805
Tonnage from Atlantic coast of North America	687,889	636,562	1,324,451	1,359,291
	(14.9%)	(15.1%)	(15%)	(15%)
Total clearances from British ports:				
Number of vessels	4,002	3,554	7,556	7,765
Tons	4,655,495	3,980,228	8,640,024	8,634,261
Tonnage going to Atlantic coast of North America	686,879	584,775	1,271,654	1,212,726
	(14.7%)	(15.1%)	(14.9%)	(14.2%)
Total value of goods:				
Exported	£40,515,070	£38,505,842	£79,019,649	£70,952,411
Imported	£61,931,266	£56,302,197	£118,118,925	£121,873,611
Exports of coal:				
Tons	3,409,768	2,796,345	6,206,108	6,369,928
Value	£2,747,914	£2,256,382	£5,004,246	£5,104,579
Tonnage shipped for use of steamers	1,117,812	969,089	2,086,901	2,211,167

surance market has a point of satiation, but it has been done in such a way that the underwriters are liable to find themselves in an awkward position if damage is done without losing the ship. The case of L'ATLANTIQUE would, one might have imagined, have warned them off but the newest, the biggest and the finest has its influence in the insurance world as in every other.

With the advent of the NORMANDIE goes the famous old MAURETANIA after an unusually long life for an express liner. Practically every shipbreaker in the world received tender forms and examined the proposition carefully but ultimately Metal Industries Ltd., bought her for about £75,000 and she is to be broken up at Rosyth. Before this announcement was made there were naturally rumors of a reprieve and further service for the wonderful old ship, one story being to the effect that she was to be chartered by one of the long distance companies to cope with the Jubilee traffic. A good many of her beautiful fittings have been removed for installation in the QUEEN MARY.

Sell Older Ships

Naturally the advent of the QUEEN MARY will cause a good deal of reshuffling in the service and personnel of the Cunard-White Star Line and numerous changes have already been made. The rationalization of the

two services has permitted the sale on a rising scrap market of a number of the older ships, especially those of the White Star branch which retained its tonnage at a time when the Cunard was disposing of many ships.

The operations of the Cunard-White Star line are not, of course, affected by the impending liquidation of the White Star Line Ltd., a company formed when Lord Kylsant took the old concern over from the International Mercantile Marine Co. There has been a lot of bitter feeling shown in the general meetings which have discussed the matter; all the capital is obviously lost but shareholders are not content to have the concern go into voluntary liquidation and quietly slide out of sight. They want the liquidation to be compulsory, with the searching investigation which is a part of the process, and it is obvious that many of them are out for blood if only they could bring the right parties within reach of proceedings.

A Big Liquidating Job

In the mean time another section of the Kylsant group has been occupying the attention of the courts, which have given their approval of the schemes for realizing the remaining assets of the Royal Mail Steam Packet Co. and Elder, Dempster & Co. They will not be as much as they might be but undoubtedly the

wise proceedings of those who stepped into the breach and have been clearing up the mess will result in the investors getting very much more of their money back than they would have had the estate been wound up in the ordinary way. Again, the fate of the two companies makes no difference to the operation of the existing companies, Royal Mail Lines Ltd. and Elder Dempster Line.

There have been rumors, unconfirmed at present that the Glen line, which was a remarkably successful company before it became involved in the Kylsant group, is being sold to Alfred Holt's Blue Funnel line which has long had an eye on its Far Eastern trade. Another interesting shipping deal is the sale of the Anchor line, running an important service to Bombay as well as to New York, to a shipping syndicate headed by the Runciman interests. Up to now they have been only concerned with tramping and the new acquisition is a well established passenger line.

One section of British shipping is, at the moment, concerned with the Australasian meat trade which is of great importance and on which large sums have recently been spent in new tonnage, including something like a dozen 10,000-ton motorships with a sea speed of 16 knots. The trade was encouraged under the Ottawa imperial trade agreement and then

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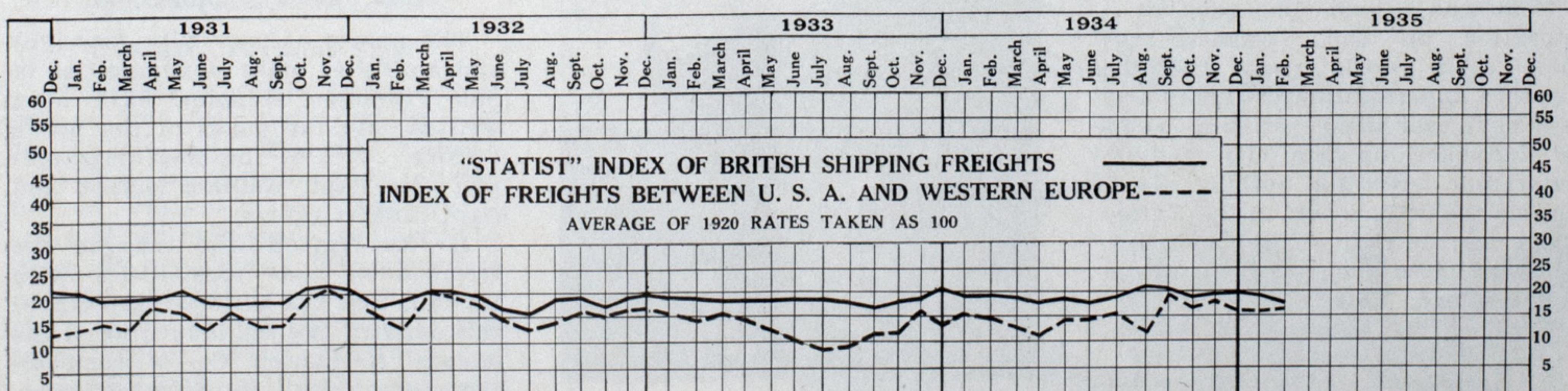
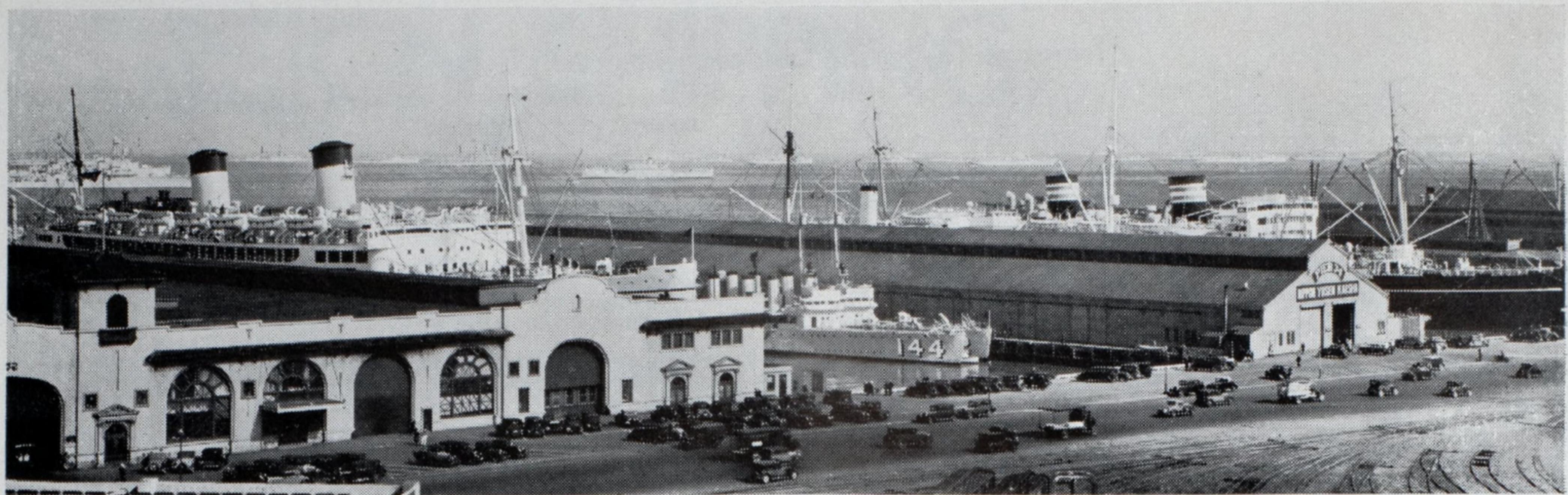


Diagram showing the fluctuation of Ocean freight rates for four years and two months



Ocean liners at dock and part of the United States Battle force in San Francisco Harbor

SAN FRANCISCO, Has One of the World's Finest Harbors

BY HERBERT O. WARREN

FROM a sheltered cove where the ships that brought the pioneers to California during the gold rush dropped their anchors, and a rocky point at which the passengers were landed with difficulty, to one of the greatest and most widely known harbors in the world, is the record of the port of San Francisco.

In '49 and '50, the harbor of San Francisco was probably more crowded with ships than any other port in the world ever was. There were windjammers from Atlantic ports, and sailing ships from every maritime nation. Without exception, entire crews, and even skippers, were headed for the mines, and it was a race to land in the huge bay of San Francisco.

A World Renowned Port

Then, overnight almost, the harbor became a city of stark spars . . . ships deserted for the more lucrative occupation of mining for gold. Many of the vessels rotted at the docks; some became floating hotels—and even prisons!

That was a long time ago but it imprinted on San Francisco the color of a world port, and the romance and tradition of those early days have ever since exerted a powerful influence on the city and its waterfront. Not for nothing did it become the second port in the United States for the rich whaling industry, following close upon the heels of old New Bedford, Mass.

The port, which is owned and op-

The photograph used to illustrate this article were furnished through the courtesy of Californians Inc. San Francisco.

erated by the state of California, under management of the state board of harbor commissioners, comprises approximately 10 miles of shoreline. San Francisco bay itself is a landlocked harbor situated almost midway between the Canadian and Mexican borders. The bay proper is 48 miles long; its greatest width is 13 miles; its area 450 square miles, with more than 100 miles of shoreline.

Today, the ships of more than 170 lines, flying the flags of many na-

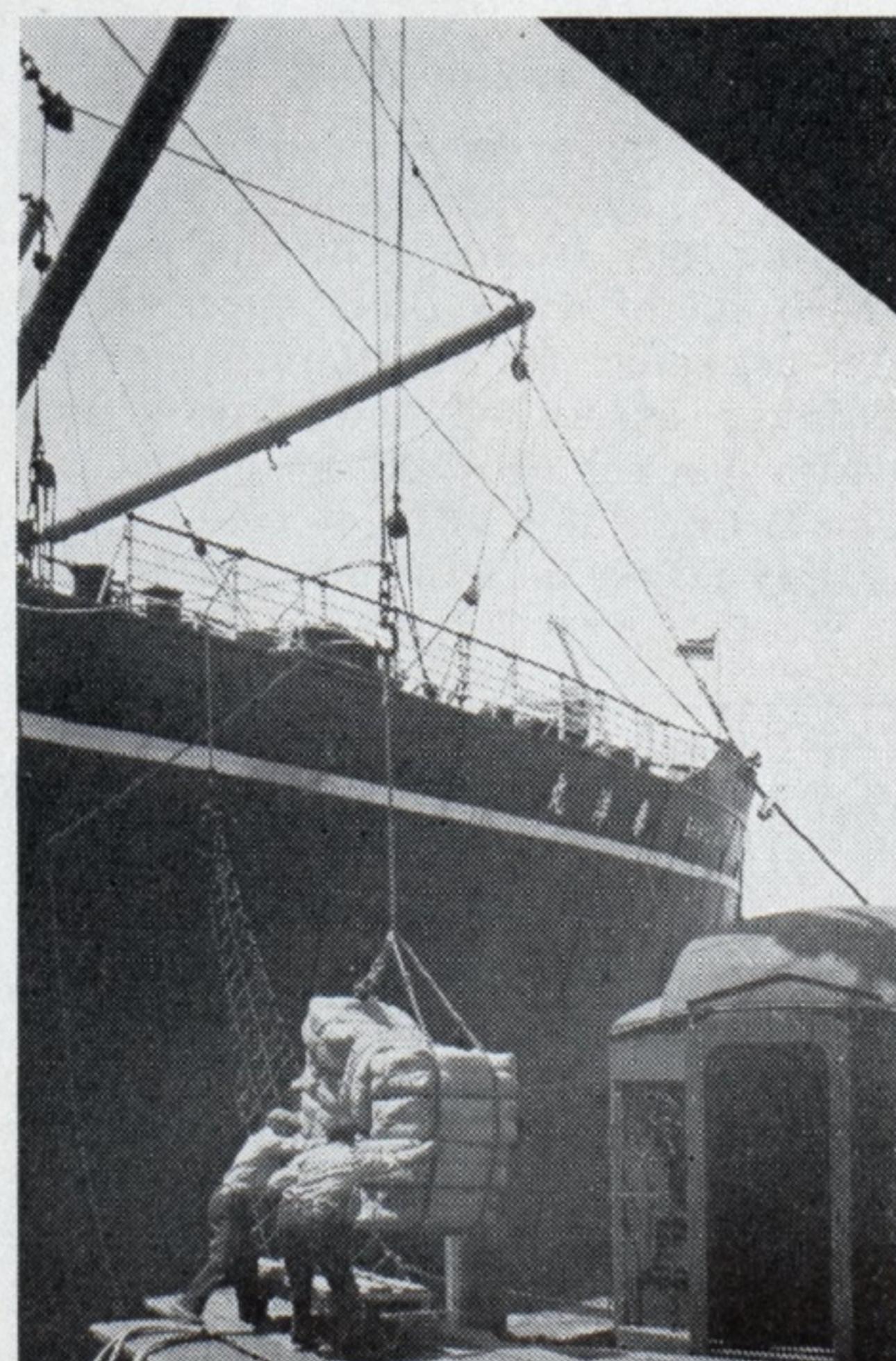
tions, carry close to \$1,000,000,000 worth of merchandise through the Golden gate annually. In addition to regular lines, there are more than 60 fishing, lumber, oil companies and inland waterway carriers. It is a recognized fact that the port of San Francisco, with its flow of waterborne commerce from the days of the clipper ships down to the ocean liners of today, has been an enormous contributing factor to the city's prosperity—and to the prosperity of the neighboring territory.

Until 70 years ago Pacific coast trade with the Orient amounted only to the cargoes of tea, silk, rice and spices carried on the side-wheelers of the Pacific Mail line, and a few American and British clipper ships. In 1880, the Spreckels brothers of San Francisco began operating a fleet of sugar packets between San Francisco and Hawaii. From that time on, trade between the islands and the mainland increased with great rapidity.

Two Famed Shipping Men

The names of men with foresight and ability to make opportunities in San Francisco shipping have been written into the pages of the port's history. Two of the most outstanding were Capt. William Matson and Capt. Robert Dollar.

It was Matson who realized the tremendous trade possibilities with Hawaii, and the ultimate growth of this activity saw the launching of the Matson Navigation Co.—a company that today, with its 5 subsidiaries, controls 47 ships plying Pacific waters. When Capt. "Billy" Matson



Shingo Maru Loading cargo at San Francisco

first arrived in San Francisco after a hazardous trip around the Horn in a windjammer, his entire possessions were contained in a battered dunnage bag.

Probably the most phenomenal rise of any steamship company in the world was that of the Dollar lines, founded by Robert Dollar, at the age of 80. When he was 58 he bought his first steamer—a lumber schooner.

Captain Dollar brought lumber from the northern coast of California to San Francisco. Until 1923 he engaged in a modest shipping business. In that year he established the first round the world freight and passenger service—against the advice of everyone. It was a success.

Getting back to San Francisco today. There are 48 piers and terminals, extensive connecting bulkheads wharves and numerous small wharves in service, for the handling of general cargo and passengers, and four car-ferry slips are required for the transportation of loaded freight cars to and from other points on the bay.

San Francisco also enjoys a tremendous volume of passenger ferry traffic, 15 passenger ferry slips being necessary for this service. Of these slips, 11 are located at the famous Ferry building, through which over

used exclusively for the handling of grain for export; the State Products terminal for dried and canned fruits and other farm products; a modern fumigating plant; pipe lines for molasses and Oriental oils, through which these commodities are pumped directly from ship to storage tanks; and a banana terminal. Also at Fisherman's lagoon is the home of a fleet of about 400 fishing boats.

The State Belt railroad, with 58 miles of main line, pier tracks and industrial spurs, connects the piers with numerous industries and with three trans-continental trunk lines and one local line.

Two large, modern fireboats, maintained jointly by the state harbor commissioners and the city and county of San Francisco, are in constant service on the waterfront for the protection of state and adjacent city property. Two state tugs are also fully equipped for fire-fighting.

The great increase in the commerce of the port of San Francisco is evidenced by the fact that it has been necessary to more than double the pier area since the beginning of the World war, and the possibilities of developing new markets for the surplus products of the great inland region served by this port, together with the increasing intercoastal trade through the Panama canal, assures

even greater expansion in the future.

The following equipment and facilities exist in the harbor of San Francisco:

Two Graving Drydocks

1—Length, 750 feet; top width, 103 feet; bottom width, 86 feet; depth, over sill, 29 feet.

1—Length, 1020 feet; top width, 153 feet; bottom width, 110 feet; depth, over sill, 45 $\frac{1}{2}$ feet.

Five Floating Drydocks

Length—range from 271 feet to 543 feet.

Width—range from 66 feet to 90 feet.

Capacity—range from 2000 tons to 15,000 tons.

Eight Marine Railways

Length, range from 250 feet to 490 feet.

Width—range from 60 feet to 76 feet.

Capacity—range from 2000 tons to 8000 tons.

Four Shear-Leg Derricks

(Three stationary, one floating)

Capacity—range from 20 tons to 100 tons.

Ten Floating Boom Derricks

Length of boom—range 90 feet to 107 feet.

Lifting Capacity—range 6 tons to 100 tons.

The following statistics show the amount of business handled through the port of San Francisco:

Tonnage, 1934 8,103,890

Vessels arriving 5,824

Imports \$54,993,000

Exports \$92,084,000

Foreign trade through San Francisco last year rose to the highest dollar levels since 1931, considerably increased exports being more than enough to offset decreased imports.

The following extracts are from *Port Series No. 12*, a report prepared by the United States board of engineers for rivers and harbors, in co-

(Continued on Page 24)



Unloading bananas by conveyors from United Fruit liners at Banana Terminal, San Francisco

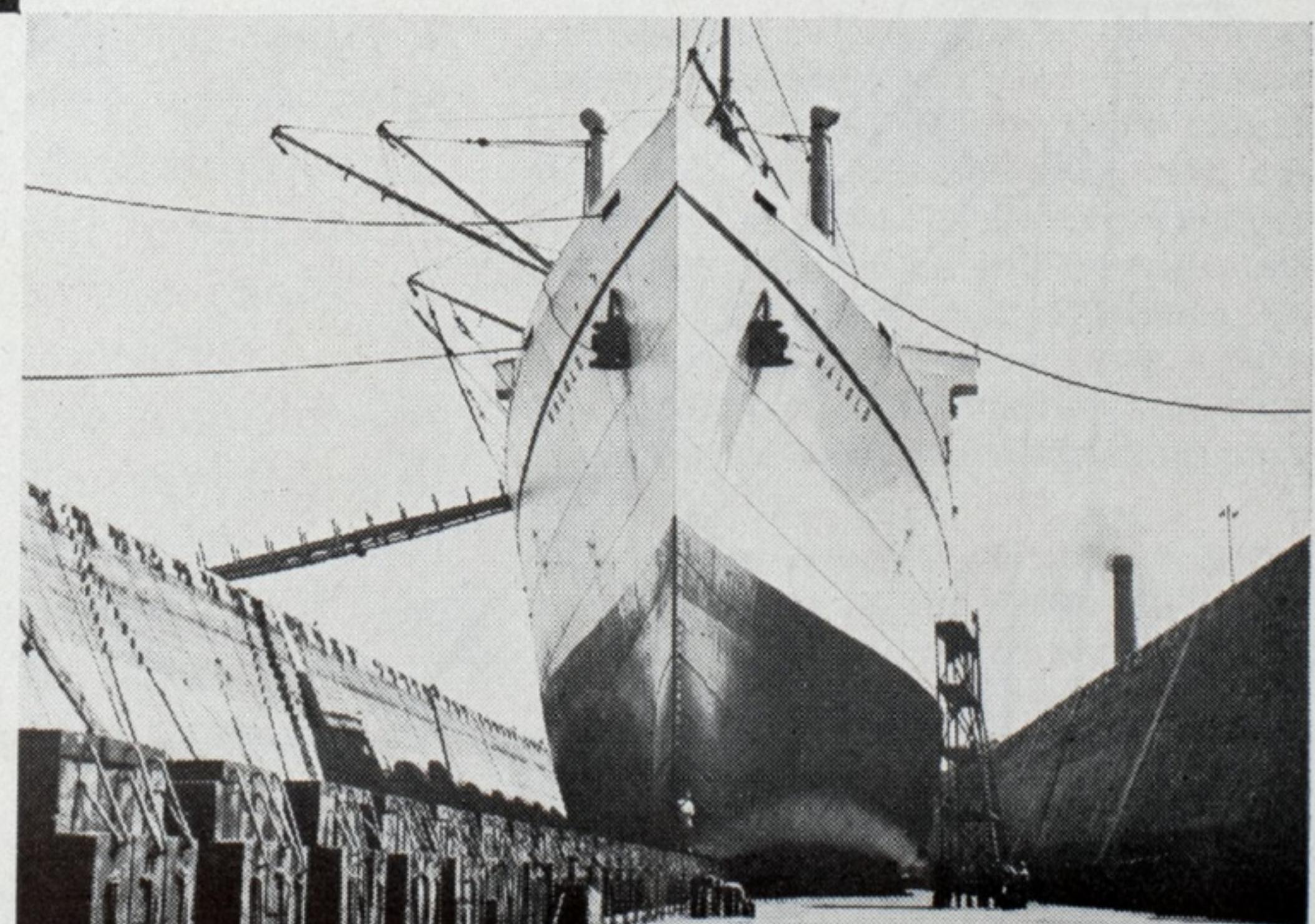
50,000,000 persons pass each year. This record is exceeded only by Carding Cross station, in London.

Extensive Berthing Space

The piers range in length from 600 to 1300 feet, and in width from 100 to 386 feet. The slips between the piers range from 100 to 300 feet in width. In all there are 17 miles of berthing space, and over 170 acres of cargo area. The harbor is dredged so that the largest battleships of the United States navy can safely anchor right at the dock.

Special features include a grain terminal, equipped with modern cleaning and grading machinery, and

Matson liner *Malolo* in Drydock at San Francisco. The port has ample facilities for service and repairs to vessels and for shipbuilding



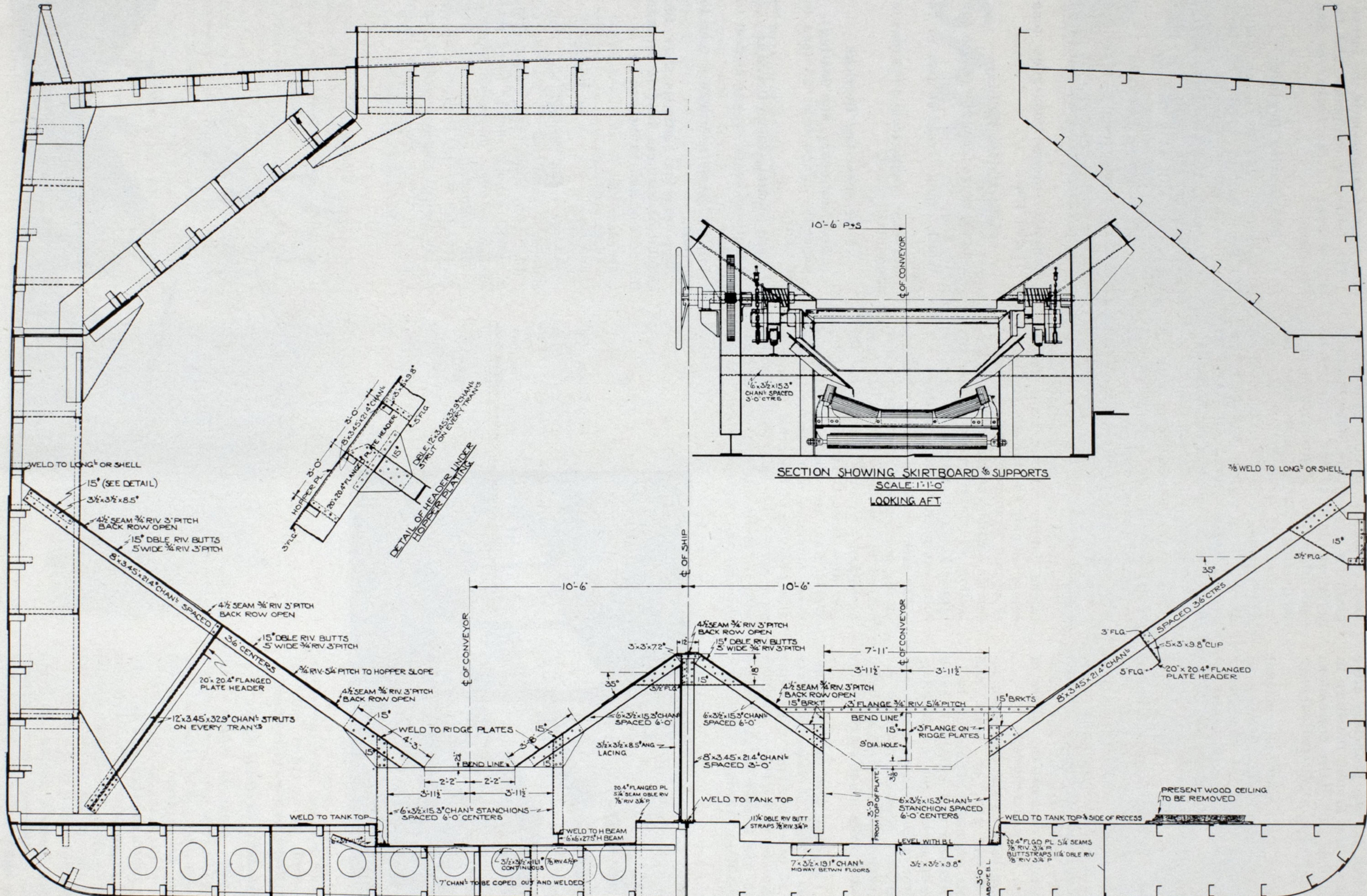


Fig. 1

TYPICAL SECTION 1'-0" AFT FRAME N° 7
LOOKING FWD.

TYPICAL SECTION 1'-0" FORD FRAME N° 75
LOOKING FORD.

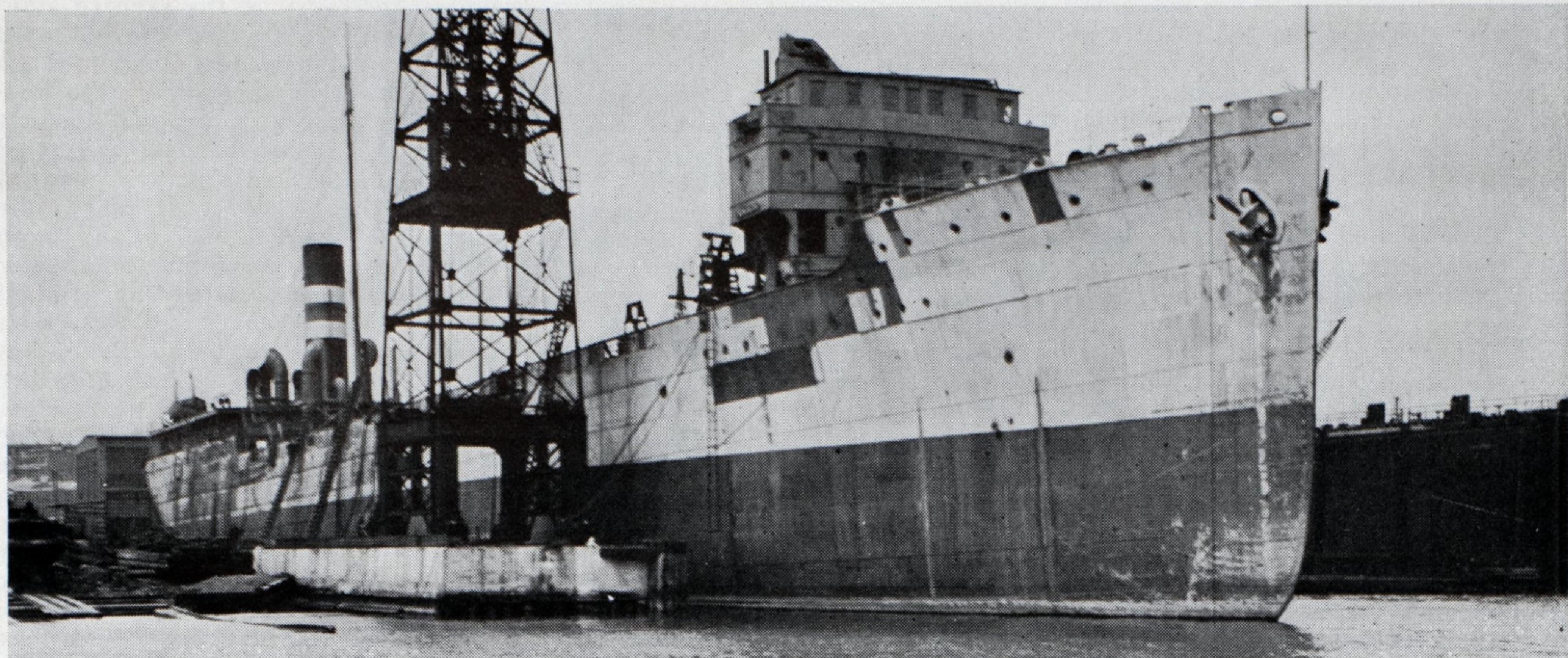


Fig. 2—Achilles nearing completion as self-unloader at the Baltimore plant of Bethlehem Shipbuilding Corp. about April 15

SELF-UNLOADER, S. S. Achilles Converted for Ocean Service

BY E. B. WILLIAMS*

THE well known Panama collier ACHILLES will again enter service, for a new owner, after completion of one of the most unusual conversion jobs in recent years. The American Steamship Co., Boland and Cornelius, managers, Buffalo, purchased the ACHILLES last fall from the Panama Canal railroad and had the vessel towed from Gatun lake to the Baltimore plant of the Bethlehem Shipbuilding Corp. where the reconstruction was carried out. The vessel left the Canal Zone Nov. 10 and arrived at Baltimore Dec. 6. Work commenced on Dec. 10, 1934, and will be completed about the middle of May, 1935.

General Characteristics

On careful examination the hull and machinery were found to be in a remarkably good state of preservation considering the long layup period of nine years.

Before proceeding with the description of the reconstruction and conversion it might be well to recall the major characteristics of the ACHILLES in her original condition as a naval collier.

The ACHILLES and sistership ULYSSES were built at the same time

by the Maryland Steel Co., Sparrow's Point, Maryland in 1915. The principal dimensions are as follows:

Length overall, 536 feet 0 inches; length between perpendiculars, 514 feet 0 inches; breadth molded, 65 feet 0 inches; depth molded, 39 feet 6 inches; draft loaded, 28 feet 1

THE self-unloader vessel has been successfully developed on the Great Lakes to increase efficiency in discharging bulk cargo and to make it possible to deliver such cargo to any waterfront point without dependance on shore unloading equipment, thus extending the range of low cost transportation. The conversion of the Achilles for coastwise ocean service will still further enlarge the scope of the self-unloader, and her performance in this service will be watched with great interest.

Editor's Note

inch; deadweight capacity, 13,563 tons; designed indicated horsepower, 7200; and designed speed, 14 knots.

The ACHILLES has a single deck with forecastle and poop. Machinery is located aft and consists of two triple expansion engines. The cylinders are 27½, 46, and 76 inch diameter by 48 inch stroke. Steam is supplied by three double ended Scotch boilers, 16 feet 0 inch diameter by 22 feet 1 inch long, 200 pounds per square inch working pressure and oil fired. The propellers are of the built-up type, three bladed, 17 feet 0 inch in diameter.

Hull of Longitudinal Construction

Topside ballast tanks are fitted outboard of the hatch coamings under the upper deck. There were originally four main cargo holds with two oil holds forward. This arrangement has been changed as will be explained later. The main cargo hatches are 32 feet wide by 20 feet long. They are divided in the center and were hinged fore and aft with king posts for handling.

A bridge house is located well forward, just aft of the cargo oil hatch. Accommodations were provided for 32 officers and a crew of 146 men. These accommodations, of course, have been largely done away with. The hull is longitudinally constructed with a continuous inner bottom extending forward to the oil holds. Fig.

*The author, E. B. Williams, is chief draftsman hull department, The American Ship Building Co., Cleveland, who acted as consulting engineer for the owner in the conversion of the collier ACHILLES to a self-unloading vessel.

4, shows the ACHILLES as she appeared in her original service as a naval collier.

The American Ship Building Co., Cleveland, having recently completed five similar reconstructions for the American Steamship Co., was retained by the owner to prepare the design plans and specifications and also to represent them during the reconstruction.

Maintaining Maximum Capacity

In general a self-unloader conversion consists of hoppering the hold to serve two belt conveyors symmetrically arranged on either side of the center line. These conveyors deliver to cross feeders at the forward end, which, in turn, feed an inclined pan conveyor which carries the cargo to the deck. At this point it is discharged through a swivel chute to a boom conveyor. The boom is pivoted to the deck and is carried by an "A" frame structure. It may be swung over the side of the vessel and topped up to any desired angle within certain limits. The boom conveyor discharges the cargo on the dock or, if desired, into railroad cars or other vessels.

The most serious problem in the design of a self-unloading vessel is in maintaining maximum cargo capacity. To insure the proper flow of material, all fore and aft plating

has a slope of 35 degrees. This involves a severe loss in cubic and every available means must be taken to keep this loss at a minimum.

As shown in the midship section Fig. 1, page 14, a new bottom has been fitted in the hold, sloping at 35 degrees toward the conveyor belts below. These belts are spaced 10 feet 6 inches each side of the center line of the ship and extend the entire length of the hold, rising forward to gain sufficient elevation to discharge properly onto the elevator. This bottom structure has been kept as low as possible in the interest of cargo capacity. In this case the tank top was recessed 12 inches as shown, thus gaining considerable cubic.

Transverse Construction

Hoppers with rectangular openings have been constructed in units, electrically welded and fitted at the bottom of the slope plating, one adjoining the other so that the openings are spaced at six-foot centers, and between them are cross saddles with 60 degree slopes. The entire structure is supported by means of channel stanchions at three-foot centers.

Because of the gate arrangement, a transverse construction seemed best for the hold bottom. This transverse system had to be tied up with the longitudinally constructed hull of the ship and this was accomplished as

shown by carrying the inboard stanchions on H bars and the outboard stiffeners on headers supported by struts at each transverse. The hoppers are kept at a definite distance above the conveyor belts and must rise with the belts at the forward end. This is shown on the profile view, Fig. 3. The ends of the cargo space terminate in sloping bulkheads.

As previously stated the original arrangement of cargo holds has been changed. The cargo oil holds forward have been eliminated, this space being given over to conveyor machinery space and general cargo. The inner bottom, of course, had to be extended throughout this space so that it now ends at the fore peak bulkhead. The former oil hatch now serves the No. 1 hold. Each of the holds No. 2 and No. 3 have been subdivided by the addition of two new bulkheads so that the vessel now contains six main cargo holds. Notwithstanding the unloading mechanism and conveyor belts below, these holds are entirely independent of each other and a variety of bulk materials may be carried at the same time.

It is interesting to note that the ACHILLES was originally a coal burner, although the inner bottom was fitted to carry oil. The coal was carried in two cross bunkers with saddle backs between. As settling tank was subsequently fitted in the lower part

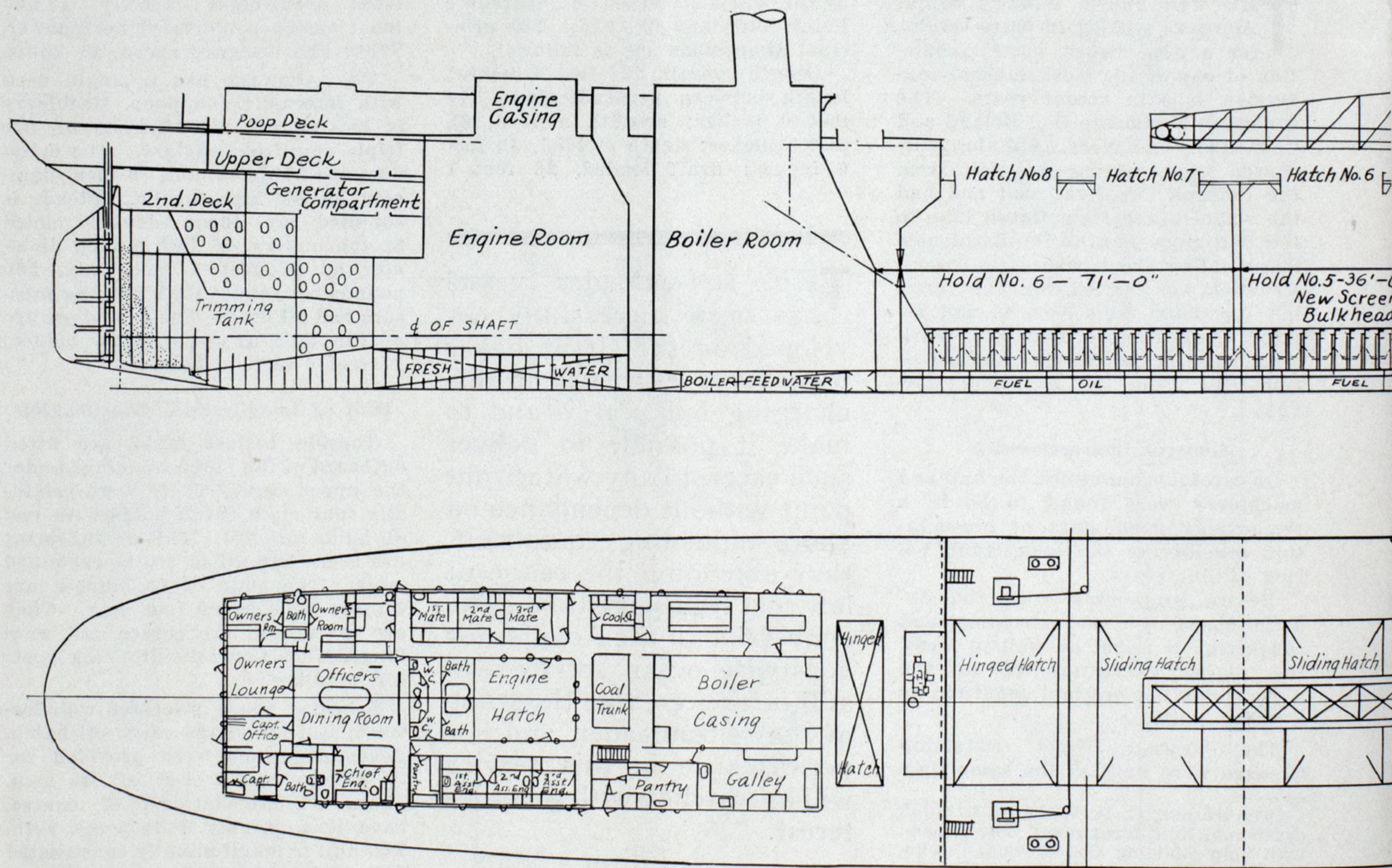
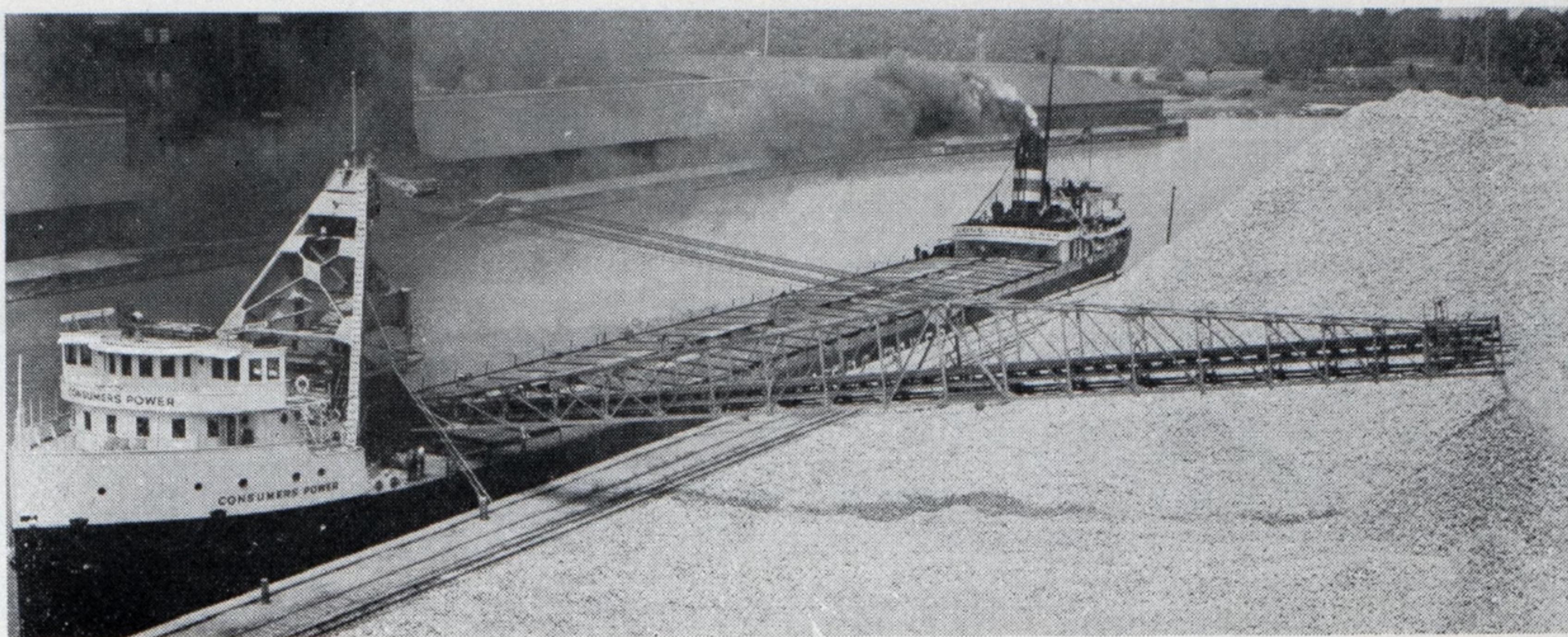


Fig. 3—General arrangement of the conversion of the Achilles to a self-unloading vessel. Hoppers in holds for feeding two parallel

The Consumers Power most recent self-unloader on the Great Lakes and generally similar in self-unloading features to the Achilles. Delivering limestone on dock at Fairport, O.



of the forward cross bunker. As shown in Fig. 3, this forward bunker is now arranged to carry cargo. The saddle back has been made watertight and large openings in the bulkhead permit the cargo to trim into the aftermost hoppers.

The throat openings of the two rows of hoppers are 4 feet 4 inches wide by 3 feet fore and aft and as stated before are spaced at 6 foot centers. Hand operated gates of the same unique design used on all Bolland and Cornelius conversions have been fitted under the hoppers. About

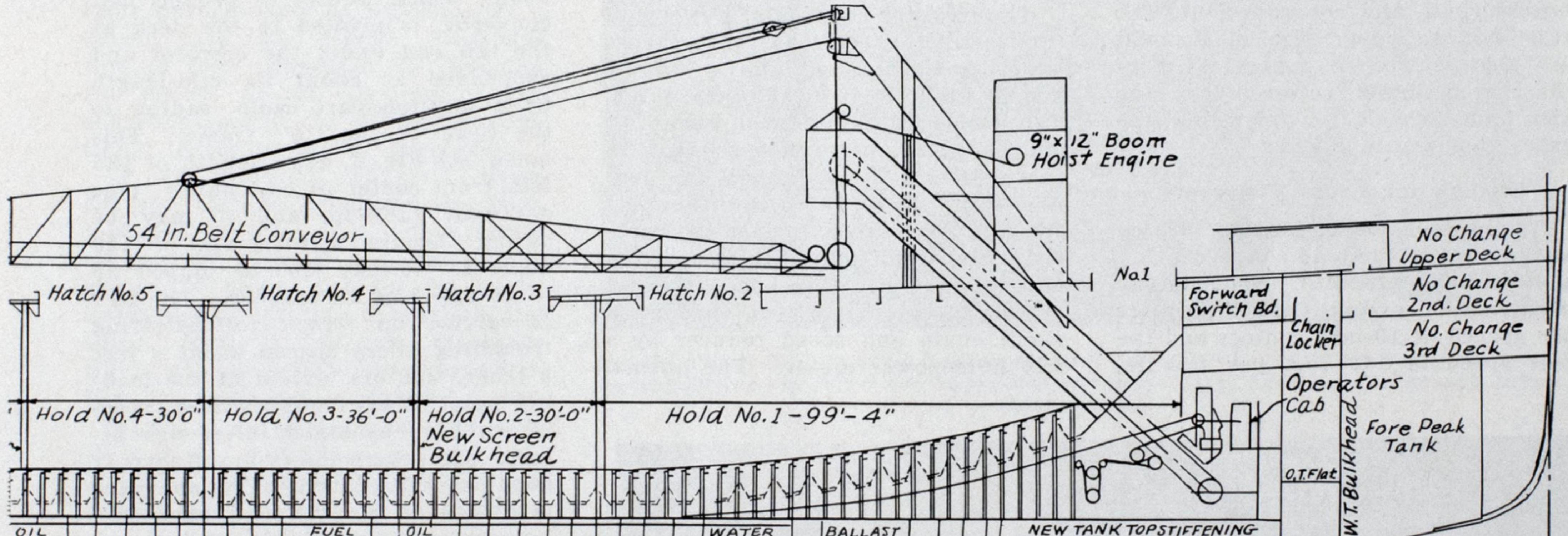
two-thirds of each opening is closed by a sliding gate to which is attached a hinged plate which closes the remaining portion.

How Gates Operate

The gates are carried on tracks which extend the entire length of the cargo hold. Each gate is individually operated by means of a hand wheel through a train of gears and chain drums. As the sliding portion moves aft, the hinged plate slowly lowers, serving as an apron to allow the material to flow in the direction of belt

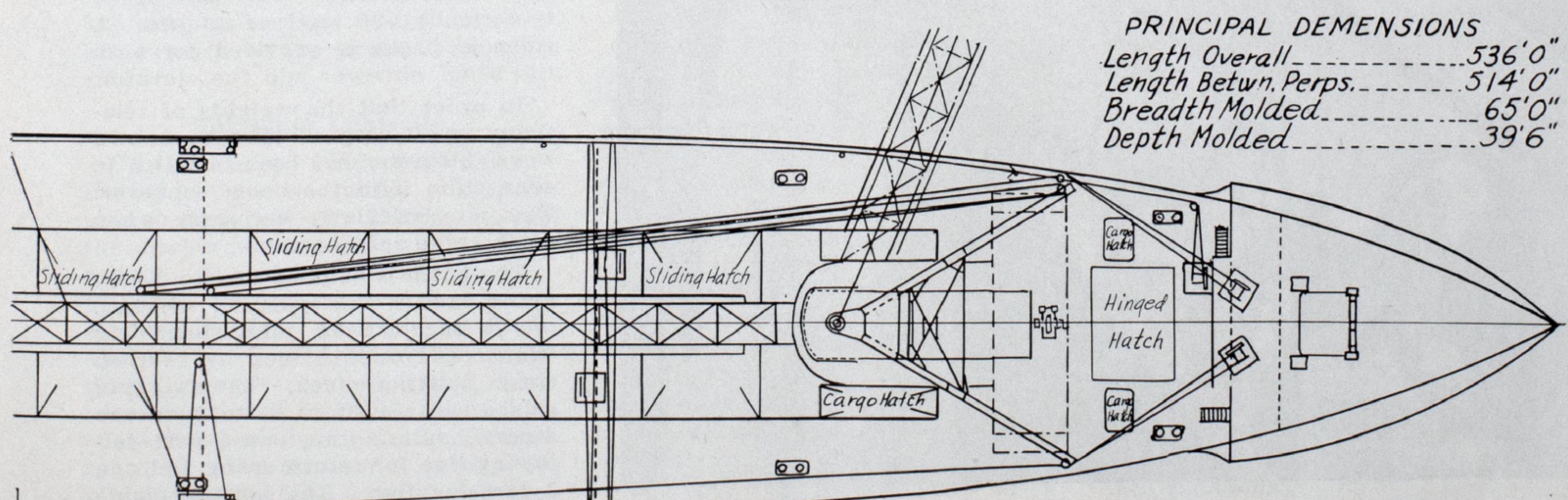
travel. The gates are usually operated in pairs and the amount of material flowing through is always under the control of the operator who, in turn, receives instructions by flashing-light signals. It can readily be seen that by this method of unloading the ship can always be kept in perfect trim and list condition.

The two hold belt conveyors are 42 inches wide and are carried on 4-inch roller-bearing troughing idlers spaced at 2-foot centers with return idlers at 9-foot centers. At the forward, or discharge end, the belts rise



PRINCIPAL DEMENSIONS

Length Overall	536'0"
Length Betw. Perps.	514'0"
Breadth Molded	65'0"
Depth Molded	39'6"



belt conveyors. At forward end pan conveyor for elevating cargo to belt conveyor, operating on boom, for discharge over side

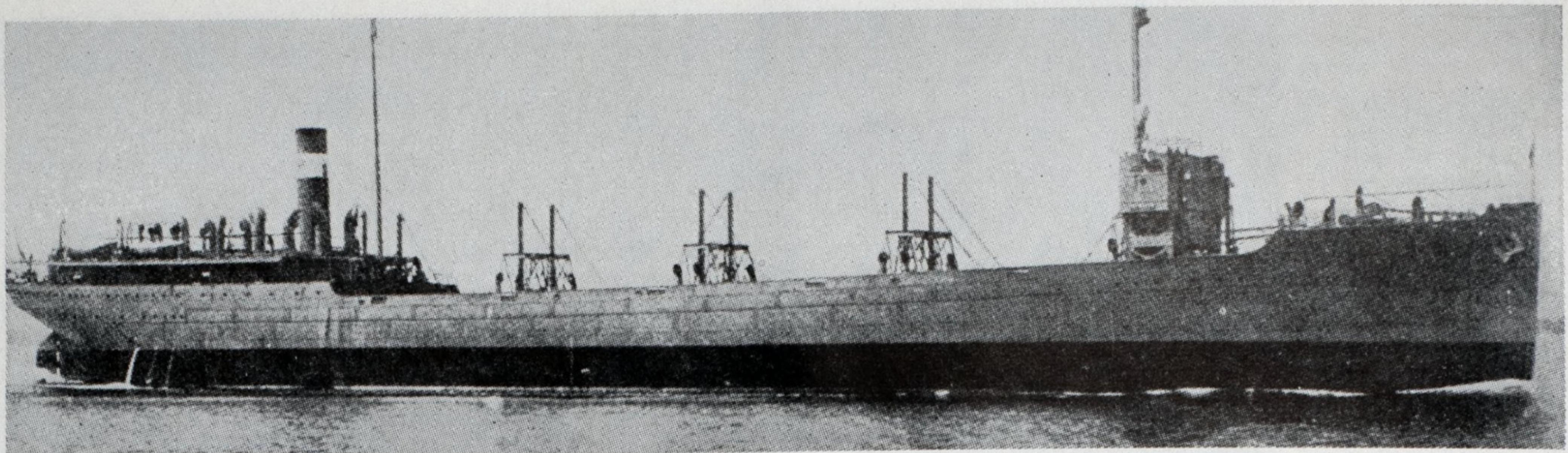


Fig. 4—The S. S. ACHILLES as she appeared in her original service as a naval collier

on a radius of about 300 feet to a point approximately 20 feet above the tank top. From this point the material is transferred to the center line of the ship on cross-conveyor feeders.

Each hold conveyor is driven by a 75 horsepower motor through a herringbone speed reducer. The normal belt speed is 470 feet per minute. Near the forward end, the return belting is fitted with a vertical, gravity type of take-up as shown in Fig. 3, thus keeping a constant tension on the belt at all times. The enlarged section in Fig. 1, page 14 illustrates the relative positions of hopper, gate and conveyor belt. The skirt boards which parallel the belt are also shown. A general view of the center tunnel, recessed tank top and hand wheels for operating the gates is shown in Fig. 5.

Feeders for Cross Conveyors

The cross-conveyor feeders, located at the head of the hold conveyors and at right angles thereto, are of similar construction except that the idlers are spaced at 10-inch centers and the belt speed is 149 feet per minute,

thus carrying a deeper load. These conveyors are driven from the tail end by means of a chain and sprocket transmission, receiving power from the hold conveyor head pulleys. The cross-conveyor head pulleys are mounted with center line of shafts 3 feet 6 inches from center line of ship. The material coming over these belts feeds a combining hopper which, in turn feeds the inclined pan conveyor. The chutes, hoppers, etc. affecting this transfer from hold conveyors to pan conveyor or elevator are of special design to minimize degradation of material, which is a matter of considerable importance.

The elevator consists of a series of interlocking steel pans 96 inches wide, and mounted on a double strand chain belt of 30-inch pitch. The structure is inclined about 42 degrees and is of sufficient length to carry the material about 20 feet above the deck where it discharged through a swivel chute onto the boom conveyor. The total lift is approximately 56 feet. The head sprocket of this elevator is driven through a silent chain and speed reducer by a 200 horsepower motor. The normal

conveyor speed is 100 feet per minute.

In the head of the elevator, which is completely housed-in above the deck, is fitted a cast steel chute through which the cargo passes to the boom conveyor. Between the cast steel chute and the unloading boom is a swivel chute which is supported by the boom structure and guided by the circular throat opening of the cast steel chute above. This chute swings with the boom.

Unloading Boom

As previously stated the unloading boom, which houses a 54-inch belt conveyor, is pivoted to the deck at the tail end under the elevator and suspended at about its mid-length by a multiple-part cable leading to the head of the "A" frame. This boom, see Fig. 3, has a length of 185 feet from center of end pulley, plus a 3-foot take-up, and it may be swung through a total arc of 226 degrees. It may also be topped up to an angle of 20 degrees. The belt is carried on 6-inch roller-bearing troughing idlers spaced about 3 feet 6 inches centers, except at the loading point where closer spaced, special rubber cushioned idlers are fitted. The return idlers are spaced at about 10-foot centers. This conveyor is driven at the tail end by a 200 horsepower motor through a spur gear transmission. The belt speed is normally 526 feet per minute. A solenoid brake is provided for both the boom conveyor and the elevator.

In order that the weights of relatively small cargoes may be known a weightometer has been installed in connection with the boom conveyor. This is particularly necessary when discharging into barges.

The boom is handled by two 9 inch by 10 inch steam swinging winches, one 8 inch by 10 inch steam tag winch, and one 10 inch by 12 inch steam hoisting winch. The swinging cables are reeved so as to have one 4-part hauling line, one 3-part following line for return swing and one 1-part tag line. The hoisting cable is reeved double in 13 parts each. Fig. 3 illustrates the arrangement.

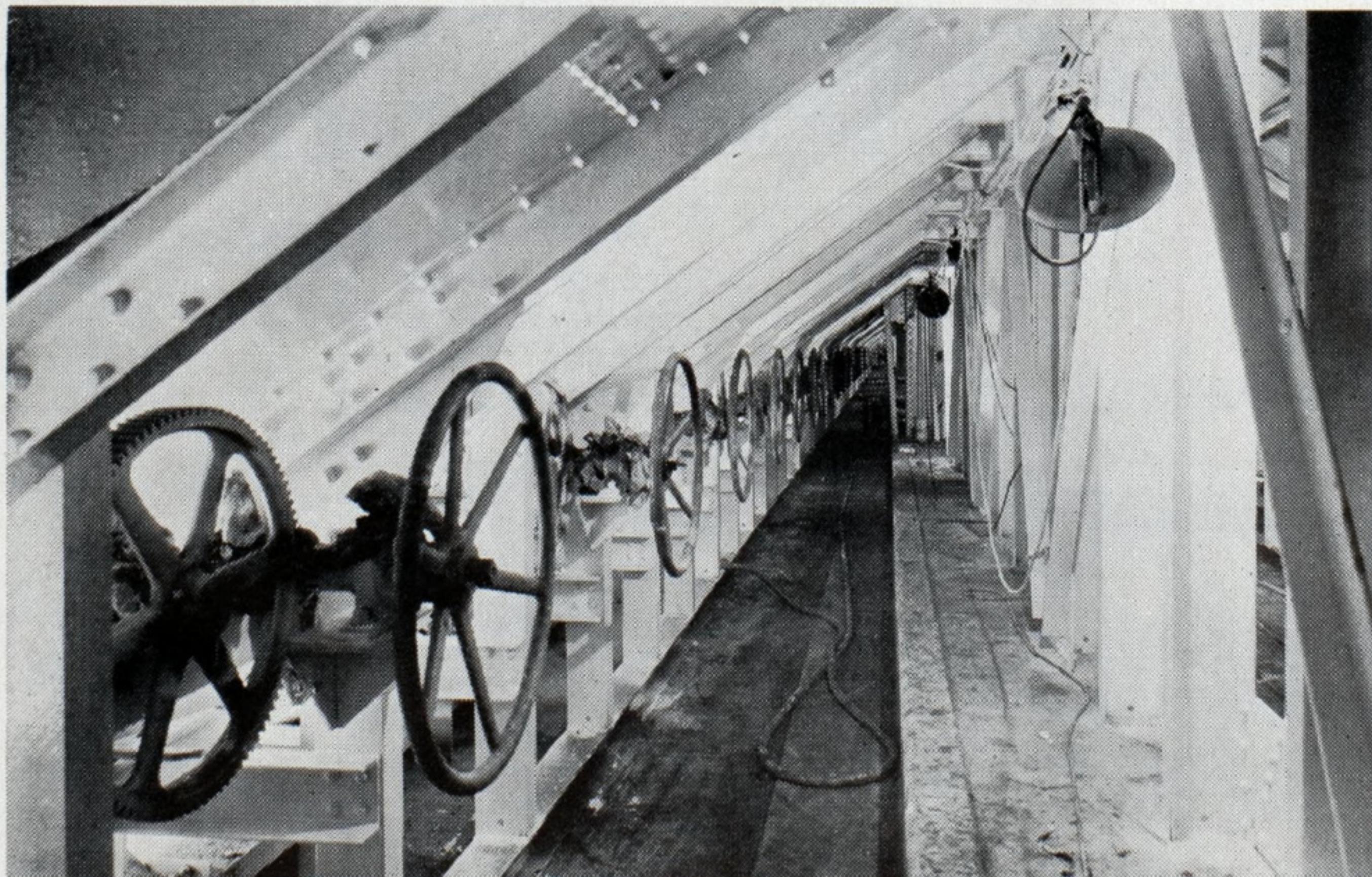


Fig. 5—Main operating tunnel of the Achilles, looking forward, showing slope of the hoppers and the controls for the gates through which cargo feeds onto conveyors

The swinging and tag winches have a centralized control station on the forecastle deck.

It will be seen from Fig. 3 that the unloading boom extends almost the entire length of the deck, necessitating the removal of the king posts, hatch winches and all operating gear. The after cargo hatch and the former bunker hatch-rest alone remain. The other main hatches were reconstructed and their covers arranged to slide outboard on rollers.

Electrical Machinery

Electrical energy to operate the conveying machinery is supplied by a 500 kilowatt, 3 phase, 45 to 66 cycles, 480-volt turbine generator with a direct connected exciter. Steam is taken at 185 pounds with no superheat. The turbine exhausts into a surface condenser at 28 inches vacuum. This machine is installed on the second deck aft on the starboard side. Bulkhead No. 24 was partially removed between the upper and second decks so that the generator space could be open to the engine room.

As stated above the 500 kilowatts generator has a variable frequency of from 45 to 66 cycles. This is accomplished by means of a speed control on the turbine. A constant voltage, however, is maintained. There are certain cargoes which by their nature must be unloaded at a slower rate than others. Degradation is thus prevented by reducing the speeds of all conveyors. The conveyor speeds are directly proportional to the generator frequency.

A 50 kilowatt, 125-volt direct current, turbine generator has been installed in the same compartment as the 500-kilowatt unit and is the source of power for certain auxiliaries and all lighting throughout the ship. Two 25-kilowatt machines which existed before the reconstruction are now used as standby power.

The main switchboard for the control of the 500 kilowatts, 50 kilowatts and distribution of light and power circuits is located on the port side in the generator compartment. From this point the 440-volt and 125-volt mains lead to the forward switchboard on the second deck, port side.

Unloading Controls

The unloading equipment is controlled from two main positions; one on deck and one below deck at the discharge point of the cross conveyors. The master circuit has two stations, one on each side of the elevator house. Adjacent to these and also at the end of the boom are three stations for operating the boom conveyor. When the boom conveyor has reached its normal speed, it will, through a system of interlocks, establish control for the elevator. There are three stations for this purpose, one on each side of

the elevator house and one in the control cab below. It is also possible to start the elevator automatically when the boom is started by means of a time relay.

When the boom and elevator are in operation the conveyors are controlled from the cab at the cross conveyors. The hold conveyors and also the gates are controlled from this point by means of flashing light signals. In the event that the hold conveyors are loaded to such a degree that there is danger of the boom being overloaded these flashing lights will operate automatically until the overload condition ceases.

An emergency stop switch is provided for each hold conveyor. This is operated by means of a pull cord extending the length of the tunnel

double row of lights is fitted throughout the main operating tunnel, with single rows of lights outboard. In addition there are lights between the hoppers directly over the belts. These are arranged to flash, and signals are thereby given to the gate operators from the Chief Operator in the control cab. Further lighting is provided to illuminate adequately the head end of the hold conveyors and the cross conveyors. Extra lighting has been provided on deck and flood lights have been installed at vantage points on the "A" frame and boom.

Two motor-driven 4-inch centrifugal dredge pumps have been installed in the tunnel, one at each end, for draining the tank top. Port and starboard suction wells are fitted

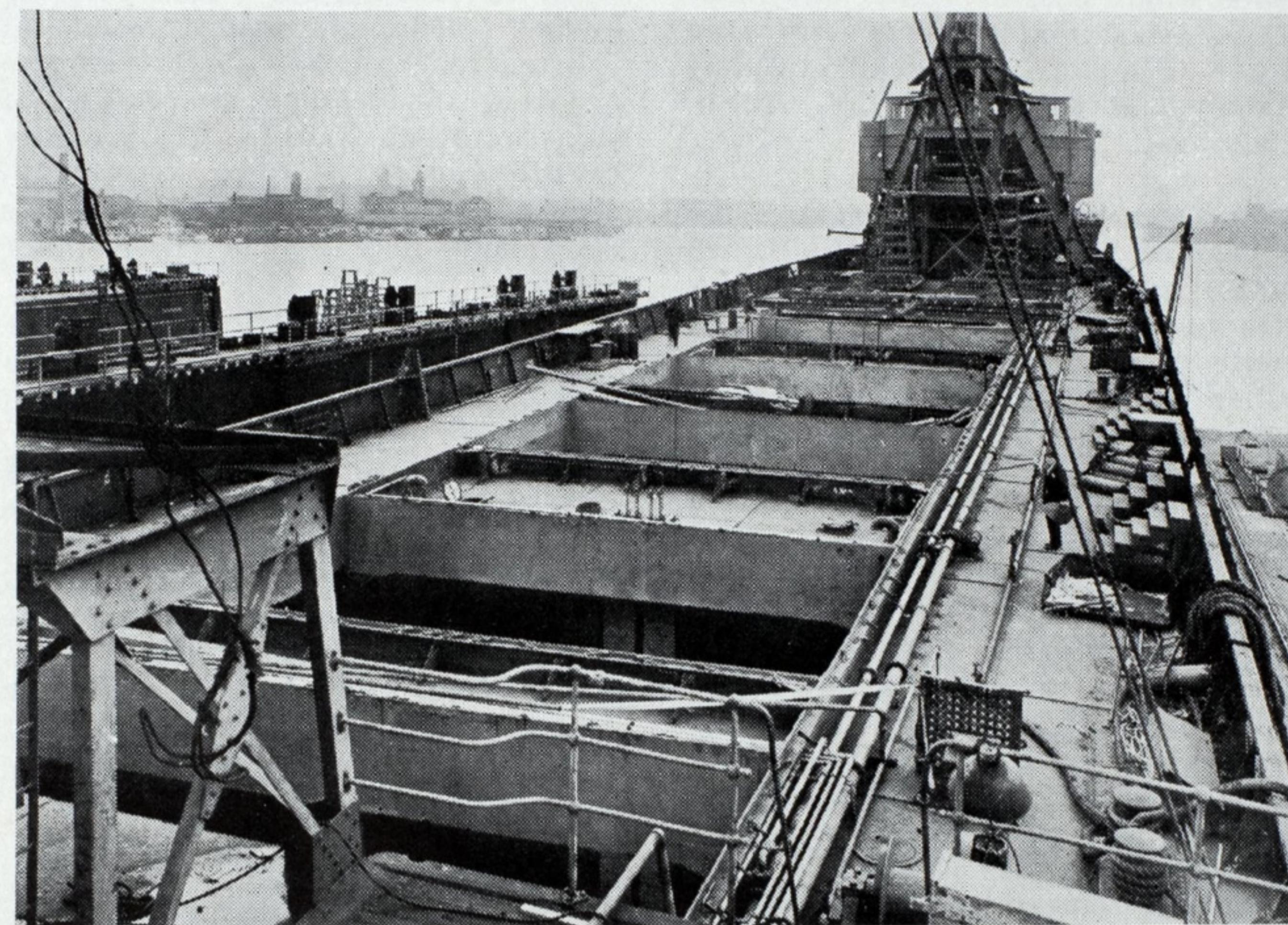


Fig. 6—The S. S. ACHILLES, looking forward on deck, showing "A" frame structure for supporting the boom conveyor, also arrangement of hatches. Photograph taken about April 15

on each side. As long as the cord is held down it is not possible to start the conveyor.

Complete Shutdown Avoided

Under normal conditions the system is in what might be termed sequence operation. In other words the conveyors are so interlocked that if any one is stopped the conveyor delivering to it is also stopped while the others continue to run. For example if for some reason the elevator is stopped the two hold belts will also stop while the boom belt continues to run and discharge its load. The individual operation of any one conveyor is also possible so that repairs or adjustments may be made without running the entire system.

The lighting requirements of a self-unloader are several times that of an ordinary cargo vessel. A

in the tank top for each pump. Discharges are also fitted port and starboard. A 4-inch flooding line is fitted to each pump sump and a 3-inch line with 1½-inch hose connections about 50 feet apart is fitted in the center tunnel.

The entire conveying equipment, including belts, drives and gate operating mechanism was furnished by the Robins Conveying Belt Co. as is the case with all American Steamship Co.'s self-unloaders.

The 500 kilowatt and 50 kilowatt generating plants, all motors and control equipment are of General Electric manufacture.

As converted, the ACHILLES has a total cargo hold capacity of approximately 455,000 cubic feet, self-trimmed. This capacity is divided into six holds.

The conveying equipment has a
(Continued on Page 24)

Late Decisions in Maritime Law

Legal Tips for Shipowners and Officers

Specially Compiled for Marine Review

By Harry Bowne Skillman

Attorney at Law

A SHIP need not be fit in all respects for all that she must meet on her voyage if she is equipped for any necessary adjustments, when she breaks ground. As respects the liability of a shipowner for loss of cargo because of stranding of ship, place where seaworthiness was to be tested was place where the ship broke ground.—*Yokohama Specie Bank v. Mitsui & Co., Ltd.*, 73 F. (2d) 526.

* * *

IN THE absence of treaty, the courts of admiralty of the United States have jurisdiction of all matters appertaining to a foreign ship while in the ports of this country. Where treaty stipulations exist, however, with regard to the right of the consul of foreign country to adjudicate controversies arising between the master and the crew, or other matters occurring on the ship exclusively subject to the foreign law, such stipulations are the law of the land and must be fairly and faithfully observed. It follows, it was declared in the case of *TAIGEN MARU*, 73 F. (2d) 922, that where a treaty with Norway provided that controversies between captains and crew should be determined by consular officials of state to which vessels in foreign ports belonged, a district court of the United States was without jurisdiction of a libel against a Norwegian steamship, filed by a member of the crew on account of personal injuries alleged to have been received on the high seas.

* * *

WHERE, on a clear night, two steamships were on crossing courses, it was the duty of the steamship which had the other on her starboard side to keep out of the way. In the case of *CONDOR*, 7 Fed. Supp. 929, it appeared that the steamship which had the other on her starboard side changed her course 10 degrees to port some 20 minutes before collision, without slackening her speed or attempting to keep out of the way of the other steamship. This was negligence.

* * *

OWNER of vessel bound with cargo from Hopewell, Va., to Alexandria, Egypt, in directing the vessel off her course to Gulf of Mexico ports to load cargo for

Italian ports which were also off her course, was held guilty of deviation, in the case of *IDA*, 7 Fed. Supp. 951, which was not permitted under the liberty clauses in the charter party providing that, as charter party was for port cargo, the vessel might proceed to destination "via port or ports." The established rules of construction of the liberty clauses are that the vessel may proceed to the port or ports which are properly in the course of the voyage described. They do not include ports either outside or beyond the ordinary route.

* * *

A MANAGER of a barge who contracted for the towing of the barge up the Hudson river, knowing at the time that ice was likely to be encountered in the river, assumed the risk incident to the probable presence of ice, but not responsibility for the tug's possible negligence in towing through the ice. The evidence in the case of *LAWRENCE J. TOMLINSON*, 8 Fed. Supp. 14, did not show negligence on the part of the towing tug.

* * *

IN THE case of *JEAN JADOT*, 8 Fed. Supp. 162, the principal issue involved was whether there was a deviation vitiating the contract of carriage. (Deviation is a voluntary departure, without necessity or reasonable cause, from the regular and usual course of a voyage.) The steamship company by its bill of lading agreed to carry merchandise from New York to Antwerp, Belgium, "shipper's order, notify Melorad, Geneva, Switzerland." Upon arrival at Antwerp, the merchandise was there discharged by the ship, but, instead of delivering the merchandise to the holder of the bill of lading, on a surrender thereof, the steamship company turned it over to another carrier to be delivered to Melorad, Geneva, Switzerland. The court held that there was no deviation, rendering the steamship company liable for the value of the cargo on its subsequent seizure by the government, but a misdelivery, which is the handing over or delivery of cargo to any wrong party. Failure of the shipowner to notify the shipper or the holder of the bill of lading of the arrival of the goods, or of the

time of the completion of the vessel's discharge, were not defenses, the court said, as the consigner was bound to be on hand to take the goods when they came to hand.

* * *

DUTY to detain alien seamen rests on one who is required to do so by the immigration inspector's order, and a fine cannot be imposed on a steamship owner's agent for failure to detain an alien seaman where the agent was not shown to have been placed under duty to detain prior to the seaman's escape. An order to detain alien seaman need not be in writing, nor in any particular form, since the requirements of law are fulfilled if the person ordered to detain seamen understands the nature of the order and knows which seamen are to be detained, and an order of detention of alien Chinese seamen is not invalid because their names are not given in the notice. Where a steamship owner failed to detain alien Chinese seamen as ordered by an immigration inspector, the secretary of labor had no discretion and was required to impose fines which he had no authority to remit—*British Empire Steam Navigation Co. v. Elting*, 74 F. (2d) 204.

* * *

AS RESPECTS a shipowner's liability for failure to detain alien seamen, notice served on the shipmaster was notice to the owner, since the master was the owner's agent and the shipowner, who through the shipmaster had notice of the immigration inspector's order to detain the seamen, was liable for penalties for failure to detain such seamen—*Societe Liguere Di Aramento v. Elting*, 74 F. (2d) 207.

* * *

IN THE case of *BERN*, 74 F. (2d) 235, it appeared that the pilot of a steamship going down East river and approaching a turn in the river knew that barges in tow of a tug going upstream were near the Manhattan shore, though he could see only the head barges, and yet he did not stop the engines until the second exchange of one-blast signals and did not reverse the engines until a full minute thereafter. The court held the steamship equally at fault with the tug in the ensuing collision.

Marine Business Statistics Condensed

Record of Traffic at Principal American Ports for Past Year

New York

(Exclusive of Domestic)

Month	Entrances		Clearances	
	No.	Net	No.	Net
March, 1935	280	1,660,503	319	1,744,741
February	232	1,367,210	269	1,505,268
January	277	1,602,975	300	1,649,284
December, 1934	282	1,429,129	267	1,409,462
November	280	1,356,331	306	1,475,818
October	290	1,555,651	284	1,539,537
September	271	1,645,919	284	1,624,272
August	296	1,815,221	332	1,859,966
July	313	1,686,825	295	1,574,395
June	239	1,696,804	324	1,785,815

Baltimore

(Exclusive of Domestic)

Month	Entrances		Clearances	
	No.	Net	No.	Net
March, 1935	100	293,568	107	325,453
February	85	267,417	92	291,094
January	86	276,468	88	286,810
December, 1934	97	299,281	95	309,991
November	88	271,778	94	288,109
October	96	282,930	100	308,916
September	91	276,111	93	284,297
August	92	278,812	96	280,641
July	108	319,702	106	317,583
June	108	339,280	112	356,445
May	104	329,312	107	328,998

New Orleans

(Exclusive of Domestic)

Month	Entrances		Clearances	
	No.	Net	No.	Net
February, 1935	166	457,420	165	439,990
January	166	457,267	166	435,232
December, 1934	172	472,463	174	477,672
November	157	431,288	157	430,060
October	175	499,832	177	492,802
September	159	453,453	157	426,341
August	145	385,557	154	403,163
July	156	439,297	154	423,642
June	141	300,349	151	416,734
May	167	482,123	152	421,839
April	169	487,655	170	475,121

Philadelphia

(Including Chester, Wilmington and the whole Philadelphia port district)

Month	Entrances		Clearances	
	No.	Net	No.	Net
March, 1935	62	182,589	57	169,667
February	38	109,838	42	132,717
January	43	131,730	41	122,204
December, 1934	62	184,844	47	136,559
November	58	156,483	56	130,800
October	55	143,330	56	146,265
September	52	143,092	44	115,845
August	56	151,501	41	120,875
July	48	125,616	35	89,902
June	61	191,042	53	155,308

Boston

(Exclusive of Domestic)

Month	Entrances		Clearances	
	No.	Net	No.	Net
February, 1935	79	281,072	51	176,760
January	88	308,292	51	191,279
December, 1934	91	309,706	59	211,394
November	92	287,743	55	205,590
October	93	339,602	63	234,302
September	110	362,773	75	238,557
August	129	377,219	106	363,789
July	136	374,494	112	392,586
June	125	337,627	105	316,594
May	105	301,785	82	245,571
April	86	309,725	58	227,404

Portland, Me.

(Exclusive of Domestic)

Month	Entrances		Clearances	
	No.	Net	No.	Net
March, 1935	10	24,475	9	21,745
February	11	23,834	12	27,693
January	12	31,676	10	25,804
December, 1934	12	24,738	16	37,026
November	21	41,916	19	34,399
October	19	34,735	17	28,611
September	16	35,064	15	34,285
August	23	31,559	21	31,672
July	14	27,034	12	26,525
June	15	30,296	16	43,232

Providence

(Exclusive of Domestic)

Month	Entrances		Clearances	
	No.	Net	No.	Net
March, 1935	6	20,792	2	8,404
February	3	15,085	4	19,642
January	2	6,682	4	12,832
December, 1934	1	2,316	3	10,988
November	4	9,158	2	2,192
October	3	11,084	1	1,901
September	4	13,022	2	8,628
August	7	12,240	5	11,809
July	4	11,634	4	17,821
June	8	14,773	4	4,887

Portland, Oreg.

(Exclusive of Domestic)

Month	Entrances		Clearances	
	No.	Net	No.	Net
March, 1935	24	98,241	36	141,262
February	29	110,749	45	175,091
January	34	126,730	45	159,415
December, 1934	27	107,555	49	185,192
November	32	129,510	44	165,914
October	27	104,387	47	182,669
September	22	83,223	41	

Latest Data on New Marine Work

Information on New Ships Ordered—Building and Repair Contracts Let—Sales—Reconditioning—Launchings—Trial Trips

THE Newport News Shipbuilding & Dry Dock Co. was low bidder on the reconditioning of two vessels to be used by the recently organized American Caribbean line of the Moore & McCormack Co., 5 Broadway, New York. On specification "A" the bid was \$1,150,000 for the conversion of the two vessels and under specification "B" the bid was \$1,145,000 for two vessels. Time of completion was given as 135 days.

Plans and specifications for the reconditioning of these two Hog Island type vessels were prepared by George G. Sharp, naval architect, New York. Accommodations are to be provided for carrying from 150 to 175 passengers on each vessel. Necessary arrangements will also be made for carrying refrigerated cargo.

Hospital Ship Launched

Sponsored by Miss Jane Sharp, daughter of George G. Sharp, naval architect, the all steel hospital ship which he designed for St. Johns Guild, was launched April 6 at the shipyard of John H. Mathis & Co., Camden, N. J. This vessel is non-self-propelled and is to be used as a floating hospital for under nourished mothers and children on daily summer excursions in New York harbor.

To be commissioned in June she will operate in conjunction with the Guild's seaside hospital at New Dorp, Staten Island, N. Y. She will be temporarily named the SHIP OF MERCY. According to the American Bureau of Shipping in which the vessel is classed her dimensions are: Length 140 feet, beam 28 feet, and depth 11 feet. She has accommodations for 1200 persons and will cost when fully equipped approximately \$200,000.

To Build Two New Piers

It is reported that work will soon begin on new piers for the Eastern Steamship lines between Franklin and North Moore streets, New York. Two piers, each 1000 feet long, are to be built. Under the construction agreement, the city of New York is to erect the substructures and the superstructures are to be built by the steamship company. The new piers will be numbered as 25 and 26. Two wide piers

are to occupy the space of Piers 24, 25 and 26, now used by the company.

The new pier 25 will be a single story structure, 125 feet in width, and the new pier 26 will be 135 feet wide, with an upper level running half its length.

May Build Two Vessels

At least two light draft diesel powered freighters will be built by Pacific coast shipbuilders if the proposed plans of the Eastern Oregon Wheat league to undertake the transportation of wheat from the Umatilla rapids on the upper Columbia river to Portland, Oreg., are carried through.

A subsidiary, the Columbia Forwarding Co., capitalized at \$400,000, has been formed to assemble a fleet and to handle freighting. These companies are controlled by producers in the wheat growing sections to be served. When the first project has been completed the service is to be extended into Idaho.

Two Gulf Tankers

It is reported that the Gulf Refining Co. has placed an order with the Sun Shipbuilding & Dry Dock Co., Chester, Pa., for the construction of two 10,000-ton deadweight tankers. The approximate dimensions are: 450 feet in length, 59 feet in breadth, and 34 feet molded depth with a load draft of 28 feet.

Tanker Returns to Service

The Texas tanker AUSTRALIA, recently returned to service after an elaborate reconstruction at the yard of Los Angeles Shipbuilding & Dry Dock Corp. The work, costing \$180,000, was carried out in quick time and in ten days ahead of schedule. The AUSTRALIA was severely damaged by an explosion when the vessel was in mid Pacific last December.

The AUSTRALIA entered the shipyard on Feb. 1 and the work was completed about April 5.

The United States Engineer office, Philadelphia, has awarded contract for building and delivery afloat of one 50-foot steel hull tug, fitted with a Kahlen-

berg diesel engine, to the Spedden Shipbuilding Co. Inc., Baltimore, for the sum of \$33,833 and 130 calendar days as time of completion.

The same office on April 3 received bids for the construction and delivery afloat of one steel diesel drive tug, 65 feet, 6 inches in length. The Alabama Dry Dock & Shipbuilding Co., Mobile, Ala., submitted the low bid, \$47,918, using a Winton diesel engine. The next lowest bid was \$49,198, using a Standard diesel engine, from Charleston Dry Dock Co., Charleston, S. C. Other bids received, with the same and other makes of engines, varied from \$53,801 to \$80,400.

To Recondition Tender

Bids were received April 10 by the superintendent of lighthouses, Buffalo, N. Y., for reconditioning the lighthouse tender CROCUS.

The lowest total bid including estimated freight, steaming and old boiler allowance was \$48,985.45 from the Buffalo Dry Dock Co. Other bids received were: American Ship Building Co., \$49,034.25; Toledo Shipbuilding Co., \$49,821.70; Buffalo Marine Construction Co., \$50,619.27; Manitowoc Shipbuilding Corp., \$60,901.25; and Great Lakes Engineering Works, \$74,316.50.

Boiler Bids Requested

Bids will be received until May 9 by the district engineer, United States engineer office, Memphis, Tenn., for two batteries of externally fired return flue marine boilers. One of these batteries will consist of five externally fired return flue marine boilers and the other battery of two similar marine boilers.

The same office on April 19 opened bids for the construction and delivery afloat of one 60-foot steel whirler derrick hull.

As noted in the April issue, McClintic-Marshall Corp. was low bidder at \$62,500 for the construction of two 225-cubic yards steel dump scows, complete with machinery and fittings, delivered afloat at Grand Haven Harbor, Mich. Contract for building these scows has now been awarded to this company by the United States engineer office, Milwaukee, Wis.

Normandie on Trial at Sea Prepares for First Trip

The NORMANDIE, French superliner, was scheduled to leave the Penhoet shipyard at St. Nazaire on April 20 for a trial run at sea. Representing half a hundred trades and crafts, 6179 artisans were at work preparing her for the trials. Two-thirds of the workmen were employed on or within the ship and the others on land in the workshops of the shipyards.

Capt. Rene Pugnet, master of the vessel, has been stationed at the shipyard several months observing operations, and was recently joined by the chief steward, chef, doctor, barman and others, who are supervising the installation of equipment that will go under their jurisdiction.

Many of the cabins of the vessel are 100 per cent complete; and work is well forward on the swimming pools and night clubs. In the galley, which is 107 feet by 195 feet, final installations of ovens and stoves have been made. An electric range, 55 feet 3 inches long, carrying 17 hot plates and 48 ovens, is almost ready for use. A steam table as long as the range, having 18 hot water containers and 20 distribution booths, is installed. A second table, equally long, is available for tourist and third-class passengers.

In the steward's department there will be 72 cooks and 76 assistants, 12 pastry cooks and confectioners, 3 ice-handlers, 12 bakers and 8 butchers, who will work under the direction of a head chef and an assistant and two sub-chefs.

The course of the sea trials has not yet been arranged, as this is written, but will probably include Brest, the former base port of the American expeditionary forces. It is expected that the ship will encircle the Azores, without stopping, and will be subjected to the severest tests possible. She will probably be away ten days, and on her return to St. Nazaire, will be prepared for her first sailing to New York, May 29.

Capt. Rene Pugnet, former commandant of the PARIS, will command the NORMANDIE when she sails from

Havre for New York in the latter part of May. Formerly chief purser of the ILE DE FRANCE, Henri Villar, has been named chief purser of the new vessel, and Jean Henry, former chief purser of the CHAMPLAIN, will be associate chief purser with Henry Villar.

Diesel Engines Ordered

Contract has been awarded by the United States engineer office, Louisville, Ky., to the Busch-Sulzer Bros. Diesel Engine Co. for furnishing two 750-horsepower diesel propelling engines, one 575-kilowatts diesel driven generating set, and one 1600-horsepower diesel engine for pump drive.

Busch-Sulzer Bros. Diesel Engine Co., St. Louis, submitted the lowest total evaluated bid for all of this equipment in the amount of \$157,600. The contract provides for furnishing electrical equipment manufactured by the Elliott Co., Jeannette, Pa.

Electrical Equipment

The Westinghouse Electric & Mfg. Co. late in March received a contract from the United States navy department amounting to approximately \$1,750,000 for electric equipment for eighteen 1500-ton destroyers.

This equipment consists of turbo generator sets, regulators, and switch-boards, which are to be installed in these new vessels now under construction in United States navy yards throughout the country.

All of this apparatus will be manufactured at the Westinghouse plants at East Pittsburgh, South Philadelphia and Newark, N. J.

As of April 20, no final action had been taken by the United States shipping board bureau with reference to the application of the American South African Line Inc. for a loan, from the construction loan fund, to aid in financing the construction of a new vessel similar to the CITY OF NEW YORK, now owned and operated by that company.

Lines of the Queen Mary Based on Model Tests

Although the so-called bulbous bow has been widely adopted in the design of big ships in the last few years, the QUEEN MARY will have the knife-edge type of bow characteristic of the famous MAURETANIA, speed queen among all merchant ships for so many years. It is likely that this decision on the part of the British designers will arouse a controversy of which much will probably be heard in the next few years.

It is true that the adoption of the knife-edge bow, with its long sleek lines which in themselves suggest speed, was decided upon only after exhaustive tests with no less than 16 different model forms, each one about 17 feet long and accurately shaped in wax. With these models over 7000 trial runs were made and the results carefully checked in the special model testing tank.

Although the form of the new Cunard White Star liner was quite definitely established some years ago, careful study has been given to the newest developments in design. From time to time tests have been made of all the various expedients put forward by those who claimed to have discovered special means for minimizing wave resistance, frictional resistance, eddy-making, pitching, and many other factors which combine to offer resistance to the movement of a ship at sea.

The tank in which John Brown & Co. conducted these experiments is equipped with machinery for creating wave conditions similar to those met with in all weathers up to a gale of 60 miles an hour velocity, which would produce waves 1000 feet long and 50 feet from crest to trough. In such miniature storms, the models were tested under conditions resembling those which the ship herself will encounter in mid Atlantic in bad weather.

Bids were to be opened on April 23 for the building of Lightship No. 112.

Bunker Prices

At New York

	Coal F. a. s. per ton	Fuel oil alongside per barrel	Diesel engine oil alongside per gallon
April 19, 1935....	5.63@5.38	1.20	4.65
Mar. 19.....	5.63@5.38	1.20	4.65
Feb. 19.....	5.63@5.38	1.20	4.65
Jan. 19.....	5.63@5.38	1.20	4.65
Dec. 19.....	5.63@5.38	1.20	4.65
Nov. 19.....	5.63@5.48	1.20	4.65
Oct. 19.....	5.63@5.48	1.20	4.65
Sept. 19.....	5.63@5.48	1.35	4.79
Aug. 18.....	5.63@5.48	1.35	4.79
July 19.....	5.63@5.48	1.35	4.79
June 19.....	5.63@5.48	1.35	4.79
May 18, 1934....	5.63@5.48	1.35	4.79

At Philadelphia

	Coal trim in bulk per ton	Fuel oil alongside per barrel	Diesel engine oil alongside per gallon
April 19, 1935....	4.93@4.68	1.20	4.61
Mar. 19.....	4.93@4.68	1.20	4.61
Feb. 19.....	4.93@4.68	1.20	4.61
Jan. 19.....	4.93@4.68	1.20	4.61
Dec. 19.....	4.93@4.68	1.20	4.61
Nov. 19.....	4.93@4.78	1.20	4.61
Oct. 19.....	4.93@4.78	1.20	4.61
Sept. 19.....	4.93@4.78	1.35	4.76
Aug. 18.....	4.93@4.78	1.35	4.76
July 19.....	4.93@4.78	1.35	4.76
June 19.....	4.93@4.78	1.35	4.76
May 18, 1934....	4.93@4.78	1.35	4.76

Other Ports

April 19, 1935
Boston, coal, per ton...\$7.32
Boston, oil, f. a. s. per barrel.....\$1.12
Hampton Roads, coal, per ton, f.o.b. piers.....\$4.75
Cardiff, coal, per ton...13s 9d
London, coal, per ton...—s—d
Antwerp, coal, per ton...16s 9d
Antwerp, Fuel oil, per ton...—s—d
Antwerp, Diesel oil, per ton.....—s—d
British ports, Fuel oil...—s—d
British ports, Diesel oil...—s—d

Self-Unloader

(Continued from Page 19)
designed or rated unloading capacity of 1400 long tons of coal at 50 pounds per cubic foot per hour. In operation a 20 per cent overload is possible. A 10,000 ton coal cargo, therefore, may be put on the dock in from 6 to 7 hours. By means of the variable speed feature, this capacity may be cut down to 950 long tons per hour, thus reducing degradation, when necessary, to a minimum not possible, as far as known, by any other method of material handling.

In addition to the conversion job, the ACHILLES has had a complete overhauling, including hull, machinery and accommodations. A new enclosed navigating bridge of steel construction has been fitted. A Sperry gyro-compass and radio direction finder have been added to the navigating equipment. An inter-communicating telephone system has been installed between the following stations: pilot house, forward control room, radio operator's room, captain's cabin, chief engineer's

cabin and generator room. In addition, two 2-station systems have been installed; one between the pilot house and engine room, and one between the pilot house and after deck. The pilot house-after deck system is equipped with loud speakers.

The crew is now quartered on the poop deck and upper deck aft. Extensive alterations have been made for their comfort and convenience. The galley and pantry have been reconditioned and have a complete new fitout. A new refrigerator has also been installed. Further alterations have been made to provide a suite of rooms with a spacious lounge for the owner's guests. Figs. 2 and 6 illustrate the vessel nearing completion.

For the first quarter of 1935, sales billed by General Electric Co., amounted to \$40,393,538, compared with \$34,935,551 for the same quarter a year ago, an increase of 16 per cent.

Orders received during the first quarter of 1935 were also greater, amounting to \$49,379,932, compared with \$38,148,654 for the same quarter of 1934, an increase of 29 per cent.

Port of San Francisco

(Continued from Page 13)
operation with the United States shipping board:

Efficient Port Management

"San Francisco bay is the best harbor on the Pacific coast and one of the finest in the world. The large sheltered deep-water area and a great amount of shoreline offer almost unlimited opportunities for terminal and industrial waterfront development.

"San Francisco is the only port in the United States where the waterfront is owned and has been developed by the state, and where also the public terminal developments have been connected with one another and with rail carriers by a belt line, owned and operated by the state.

"San Francisco is a shining example of efficient control of terminal and interchange facilities. There is no friction, no congestion, no delays at this port. Traffic moves to and from the piers with a smoothness and facility which is noticeably absent at some other ports not adequately co-ordinated."

Magnolia, Ocean Tanker, Launched at Camden

THE ocean tanker MAGNOLIA, sister ship of the SOCONY VACUUM, built at the same yard for the same owner, the Socony Vacuum Oil Co. Inc., New York, was launched by the New York Shipbuilding Corp. at Camden, N. J., on April 2. The new vessel will be completed early in June. The keel of both vessels were laid March 26, 1934. The tanker SOCONY VACUUM was launched Jan. 18, 1935, and completed on April 1.

In the launching of the MAGNOLIA, the largest shipbuilding program in the American merchant marine at the present time is drawing to a close. The MAGNOLIA is the fifth and last vessel of this program, calling for an expenditure of \$5,000,000, to be launched for the Socony Vacuum Oil Co. since June, 1934. In addition to these two ocean going tankers, the program included three twin screw diesel tankers, the NEW HAVEN SOCONY, PLATTSBURG SOCONY and Poughkeepsie SOCONY, built at the yard of United Dry Docks Inc., New York, and now in service on the Hudson river, New York State Barge canal and the Great Lakes. These vessels have been fully described in MARINE REVIEW for September, 1934, and April, 1935.

The principal characteristics of the MAGNOLIA are: Length over all, 500 feet, 1½ inches; length between perpendiculars, 484 feet; breadth molded, 65 feet, 9 inches; depth molded, 37 feet; deadweight, 15,285

tons; gross tonnage, 9600; pay load capacity, 5,323,000 gallons; speed 12½ knots.

The propelling machinery consists of one double reduction geared turbine built by the DeLaval Steam Turbine Co. This turbine develops 4000 brake horsepower at 75 revolutions per minute of the propeller. There are three Foster Wheeler marine watertube boilers. Two of these, operating at 400 pounds pressure and with superheat to give 700 degrees Fahr. final steam temperature, sup-

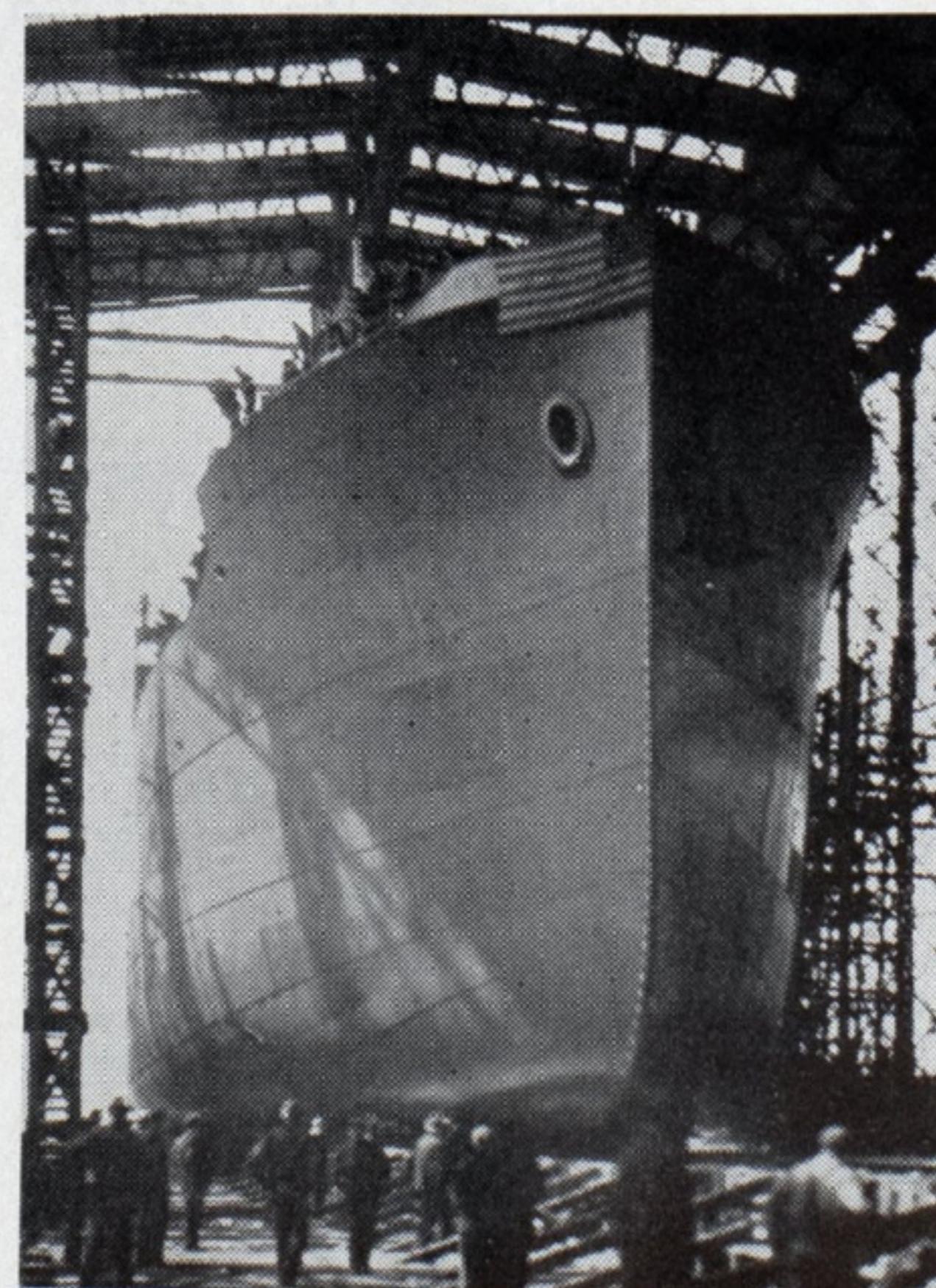
ply steam for the main drive; the third boiler, which is not fitted with superheaters, furnishes steam for the cargo pumps. All of the boilers are oil fired, using Todd oil burning equipment and are fitted with soot blowers supplied by the Diamond Power Specialty Corp.

There are three General Electric turbine driven generators; two of these of 75 kilowatts each and one of 20 kilowatts.

Built on the Isherwood bracketless system of construction and completely equipped with modern applicances throughout, the MAGNOLIA, like her sister ship, will be one of the finest tankers afloat when she enters service. She is equipped with latest aids to navigation, including Sperry gyro-compass and pilot, radio direction finder, short and long wave radio communications, fathometer and numerous safety devices in connection with the high pressure superheated steam plant for propelling machinery.

The MAGNOLIA and sister ship and the three smaller tankers were designed by Nicholas J. Pluymert, naval architect for the Socony Vacuum Oil Co., who has designed all of the vessels built for the company during the past 25 years.

The sponsor of the launching was Mrs. J. A. Brown, wife of the chairman of the executive committee of the Socony Vacuum Oil Transportation Co. A bottle of domestic champagne, of New York state vintage, was used.



Tanker Magnolia launched April 2

LAKE CARRIERS

Hold Annual Meeting at Cleveland

AMERICAN steamship companies on the Great Lakes, members of the Lake Carrier's association, were well represented at the annual meeting of the association held at Cleveland, April 18. This meeting is timed, according to long established custom, to take place shortly before the opening of navigation. Though regular traffic had not commenced before the meeting was held, a considerable number of self-unloaders and other vessels called on for needed service were already in operation.

The business of the meeting was of routine character. No predictions were offered as to the prospects for an active season. Individual opinions were divided, with somewhat of a leaning toward optimism. Since the principal trades are coal upbound and ore, grain and stone downbound, business for the steamship companies will depend upon general recovery and the continuation and increase in steel production.

The 1934 season showed a 6.1 per cent improvement in total bulk cargo movement over 1933, and an improvement of 81.7 per cent over the year 1932. It was in fact 1,590,625 short tons over the season of 1931. The movement in bulk commodities during 1934 was 75,739,490 short tons and it is safe to say that the consensus of opinion is that the present year will exceed that figure, with the degree of improvement dependent on the rate of business recovery.

Capt. Wood Re-elected President

Capt. Joseph S. Wood, president of the association, presided at the meeting. Member companies of the Lake Carriers association own 397 vessels of 2,187,036 gross tons. Of this tonnage, 89.9 per cent was represented at the meeting, either directly or by proxy. The number of directors was increased from 43 to 45. Three new directors were elected and one resigned. The new directors are E. B. Greene, Crispin Oglebay and J. T. Hutchinson.

The executive committee was increased from 12 to 13 in number. Three of the former members of the executive committee resigned and four new members were elected. The latter are: W. H. McGean, Crispin Oglebay, E. B. Greene and Capt. R. W. England. All officers were re-elected as noted in the accompanying tabulation of officers and directors.

Reports received from George M.

President
JOSEPH S. WOOD
Vice President
L. C. SABIN
Vice President
Secretary and Treasurer
GEORGE A. MARR
General Counsel
NEWTON D. BAKER
Executive Committee

A. E. Cornelius, A. F. Harvey, J. M. Gross, Elton Hoyt II, G. A. Tomlinson, G. M. Humphrey, H. S. Wilkinson, W. J. Conners Jr., W. W. Newcomet, W. H. McGean, Crispin Oglebay, E. B. Greene, R. W. England.

Alternates

J. Burton Ayers, Frank Armstrong, J. J. Boland, A. H. Ferbert, Warren C. Jones, F. I. Kennedy, H. S. Noble, F. C. Oakes, A. C. Sullivan, G. H. Warner, J. T. Hutchinson, J. T. Kelly, A. E. R. Schneider.

Directors

Joseph S. Wood, Chairman
From Cleveland

Frank Armstrong, J. S. Ashley, J. Burton Ayers, Newton D. Baker, S. B. Cady, R. W. England, A. H. Ferbert, E. B. Greene, J. M. Gross, A. F. Harvey, Elton Hoyt II, G. M. Humphrey, C. L. Hutchinson, J. T. Hutchinson, Warren C. Jones, John T. Kelly, Geo. S. Kendrick, F. I. Kennedy, Geo. A. Marr, Walton H. McGean, Crispin Oglebay, R. J. Paisley, C. J. Peck, L. C. Sabin, A. E. R. Schneider, Geo. M. Steinbrenner, H. C. Strom, Baird Tewksbury, G. A. Tomlinson, R. B. Wallace, Geo. H. Warner, A. T. Wood.

From Other Cities

J. J. Boland, A. E. Cornelius, W. J. Conners Jr., J. E. McAlpine, H. S. Noble and F. C. Oakes of Buffalo; H. F. Hughes and A. C. Sullivan of Chicago; J. G. Munson of Rogers City; W. W. Newcomet, Sheboygan, Wis.; W. P. Snyder Jr. of Pittsburgh, and H. S. Wilkinson of New York.

Steinbrenner, chairman of the welfare committee, and Capt. R. W. England, chairman of the shore captains' committee, were read by the secretary and a vote of appreciation was recorded. Since both of these reports cover activities of vital importance to men and owners engaged in lake shipping, they are presented practically in full below.

Welfare Committee's Report

DUE to continued depressed condition of lake marine business and the policy of not registering men unless actually employed, the registration in the welfare plan totaled 11,068 men against the peak year of 1926 when there were 25,844 members.

Notwithstanding decrease in revenue, the usual facilities were provided, such as assembly rooms, schools, banking facilities, library at the Soo; and on some of the ships, the operation of the ship's safety committees. The *Bulletin* was likewise published as a means of conveying to the men on board ship, the activities of the welfare plan, and other news of general interest.

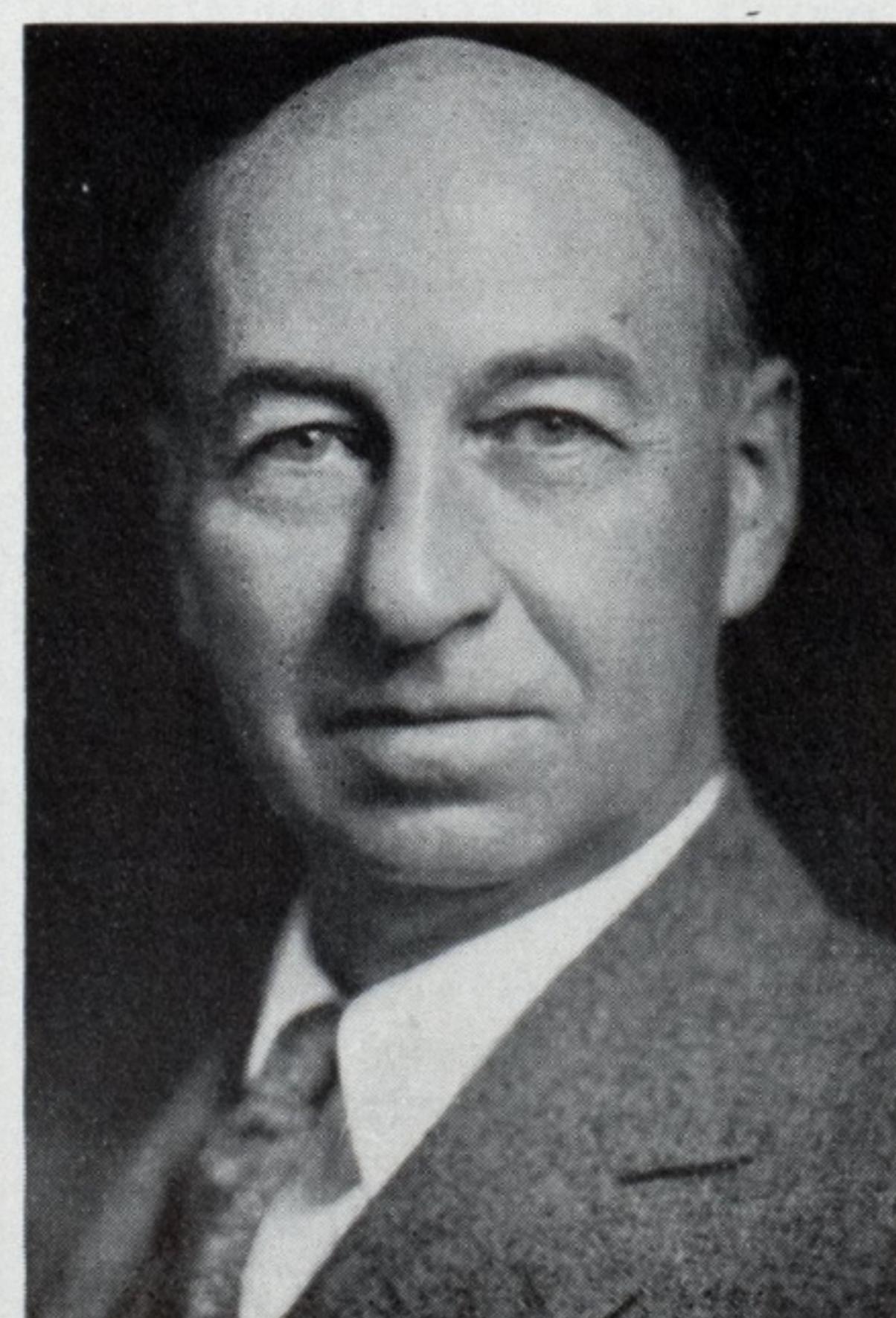
A satisfied employe is an asset to the ship, and it must be apparent to members that the benefits derived by the sailors through the various activities of the welfare plan have been reflected in the advantages which the employers have had in the co-operation of the men aboard the ships, and the long period of peace which we have enjoyed in our labor relations.

The committee therefore recommends the continuance of all past activities, and if possible, the introduction of anything new which would be of benefit to the men.

Fictitious Injury Claims

It is the opinion of the committee that more attention must be paid to the safety work on board our ships. The occurrences of the past two or three seasons when we have been literally swamped with fictitious injury claims, must make this clear to all. Those of us who carry insurance covering these injury claims turn them over to our underwriters for adjustment and some of our underwriters would rather settle a case than have a fight. As a broad policy, this might be all right, but it is one of the causes of the increase of our injury claims on board ship.

More care should also be exercised



Capt. Joseph S. Wood

in shipping men, and if injury claims are persisted in by chronic claimants, it may be necessary to adopt a system of physical examinations or other means of assuring the ships sailors who are physically fit, and not a menace to their own safety or that of their shipmates and of the vessel.

Shore Captains Report

THE shore captains committee held a number of meetings during the past year. Recommendations of the navigation committee were reviewed and such as seemed proper were approved and presented to the executive committee.

The program, now under way, of deepening the waterways has created a real problem in certain of the narrow rock bottom channels, Ballards reef being the most serious. Here the placing of drills and dredges and the closing of certain sections while the work was in progress made navigation particularly difficult. After intensive study by the shore captains and Mr. Sabin, your vice president, together with the United States engineers and with the assistance of the coast guard and lighthouse department the work is being performed, we believe with the least interference to navigation that is possible.

A committee of the shore captains, Mr. Sabin and the United States engineer at Detroit have made trips on steamers to observe the navigation of this waterway with the work actually in progress, and while it is agreed that it is far from satisfactory, we believe that the arrangements that have been made are the best that can be made for the carrying on of the deepening of the channels. It will require the greatest care on the part of all masters until such time as the work is completed when we will have fine safe channels.

Lake Michigan Lanes

The shore captains have made considerable study of the Lake Michigan up and down bound lanes and have changed them somewhat to meet new conditions. It is appreciated that on Lake Michigan the up and down bound lanes as laid out, by no means eliminate all danger of collision in thick weather, but it is agreed that under the rules we are separating two major up and down bound fleets which is helpful, and does eliminate danger of collision in a very large measure.

A slight change was made in the down bound course from Poe reef to the down bound lane on Lake Huron which we believe will be helpful.

The shore captains committee has had before it a number of disasters which have been presented by the investigating committee of the Great Lakes Protective association, and we are impressed with the fact

that great care should be exercised in entering ports where there is any question at all as to the draft of water, particularly those ports where the lake level is affected by high winds. Two vessels became total losses last year, one on the east coast of Lake Michigan and one on the west coast, and there are several other cases where serious damage was done in attempting to enter ports in heavy weather where it should be anticipated that the lake level is lower on this account. A steamer arriving off one of these ports under bad weather conditions should stay outside until such time as it is safe to enter the port.

Captains Have Co-operated

Taking into consideration the hazards of the navigation of the channels and the congested waterways, we feel that the masters in general have navigated their ships with great care. They have followed the rules laid down for their guidance and have exercised good judgment. The cases where rules were violated or where there was a complete lack of good judgment exercised are so few that we believe full co-operation is being given the association by the practical men aboard ship.

All of the government departments at the present time are more than co-operating with your association in their willingness to contribute to every possible aid for safe navigation that is within their power and if the full support of all managers is given to their masters we believe that accidents can be kept to a minimum.

GREAT LAKES RED BOOK

THE Great Lakes Red Book, vest-pocket directory giving the names of owners, operators, vessels and where appointments have been made, captains and engineers of all shipping on the Great Lakes, for the year 1935 in its thirty second annual edition, will be ready about May 7. The Red Book is published each year at Cleveland, by MARINE REVIEW under the direction of A. H. Jansson, editor.

The 1935 edition of the Red Book lists over 1500 vessels of the Great Lakes. There is also a complete directory of the shipbuilding and ship repair yards on the Great Lakes. This directory gives the names of all principal officers and the drydock, repair and building facilities at each yard.

Individual vessels and fleets are alphabetically arranged. The capacities of all ore carriers are given and there is also a complete port directory.

Protective Association in Annual Meeting

The annual meeting of the Great Lakes Protective Association was held at Cleveland April 18. J. S. Ashley, chairman, presided. The entire membership of the association was represented either directly or by proxy. All members of the advisory committee were re-elected and they are: J. S. Ashley, chairman; A. E. Cornelius, R. W. England, John T. Kelly, W. W. Newcomer, C. J. Peck, A. E. R. Schneider, George M. Steinbrenner, Baird Tewksbury, R. B. Wallace and George H. Warner.

According to the annual report of the association the showing for the year 1934 was quite satisfactory, everything considered. There were 44 losses of which 23 have already been adjusted. From estimates made of the remaining 21 losses, the indications are that there will be an excess of contributions over losses for the fiscal year of about \$107,000. The total of contributions paid was \$393,779.83 and the losses so far paid amount to \$250,194.76. By contrast the returns for the fiscal year 1933 so far indicate an excess of losses over contributions in the amount of about \$630.

The fiscal year 1934 was the twenty-sixth year since the organization of the Great Lakes Protective association and it is the sixth year in which 50 per cent of the valuation of vessels in its membership has been reserved from conventional insurance. Membership in the association included 101 vessels of which fifteen commenced operation last year after April 20, twenty-three entered service May 1, thirty-seven later in May, five in June, one in August, and one in November, making a total of 82 in commission of the vessels holding membership in the association. Nineteen did not operate at all during 1934.

The advisory committee will meet at a later date to elect officers of the association for a term of one year. It is expected that the present officers will be re-elected: They are: J. S. Ashley, chairman; George A. Marr, secretary and attorney-in-fact; A. E. R. Schneider, treasurer; J. A. Armstrong, assistant treasurer; and Robert G. McCreary, counsel.

Bookings Show Increase

Anchor line bookings for the first three months of 1935 have shown an increase over the corresponding period of last year, according to Harold P. Borer, general passenger manager of the line. Advance bookings for May, June and July are also considerably ahead of the second three months of 1934. There has been an increase of 48 per cent in the bookings for the first quarter in 1935 as compared to the same period in 1934. Gain in first class passage is also shown.

ACCIDENT PREVENTION

In Small and Large Marine Operations

BY EDWIN B. TICHENOR

SMALL marine operations had worse accident records during 1933 than large organizations. Frequency rates for large operations averaged less than half of those for the small. Large operations also showed a superiority when severity rates were contrasted. In 1933, large units had a frequency rate of 12.78 and a severity rate of 1.86; small, a frequency rate of 29.95 and a severity rate of 3.32.

Why is this so?

In a few words: The superiority of large units was due to the excellent results of large shipbuilding and repair yards; rates of the large organizations in this group were about one-third of the averages for small units. However, opposed to this fact, were the lower rates of small tanker fleets, especially in severity, as contrasted with those of the large.

Small and Large Operations

Since it may be said that the majority of small tanker fleets is owned by large oil companies which are doing excellent safety work, and since it is generally recognized that the large companies have been leaders in accident preventive effort, it becomes apparent that size of operations has comparatively little connection with the relative safety with which they may be conducted, as is borne out by the 1933 figures.

Fundamentally, safety is divided into what the National Safety Council has long called the three E's—education, enforcement and engineering. Time and experience have proved the soundness of this axiom. The theory is that if all machinery and other features of the working place are made as safe as possible and if every workman is properly trained and all regulations calculated for safety are rigidly enforced, accidents will approximate the theoretical zero. It is obvious that the dangerous elements of the working place cannot be eliminated unless it is known where they are, nor can workers be trained in safety and regulations worked out and enforced without knowing how accidents are caused.

Therefore it is essential, in every industry, to have accident facts—the

The author, Edwin B. Tichenor, is attached to the staff of the National Safety Council. This article was prepared for MARINE REVIEW at the request of the editor.

how, where, why, and how many—with which to ferret out the causes of accidents and thus determine preventative measures. It is here that accident reporting and analysis play a leading role.

The executive who is seriously interested in preventing injury to his workers and damage to his property must first consider accidents, not as things that "just happen," but as the results of mistakes, and rather common mistakes, at that.

Common Mistakes, Not Accidents

For example, Byron O. Pickard, safety engineer in charge of a survey conducted several years ago by the accident prevention department of the Pacific Coast Ship Owners and Waterfront Employers' association, San Francisco, in which 7754 lost-time injuries to longshoremen, were studied, came to the definite conclusion that less than 2 per cent of these so-called accidents could properly be classified as accidents. "Eighty per cent of them," he said, "are predictable, and the causes are so common that the word 'accident' should be changed to 'common mistakes' because accidents of this kind are no longer unforeseen and unexpected occurrences except probably to the particular employes involved.

"It may be roughly assumed," Mr. Pickard also said, "that approximately 75 per cent of all industrial injuries could have been prevented if those who were injured had been properly trained, properly disciplined, if they had been physically fit, and properly selected for the job—in other words, if they had been properly supervised. But physical conditions—such as lack of guards, defective equipment, poor lights, poor ventilation, poor sanitation, etc., also account for a sufficient number of industrial injuries and accidents, even though relatively unimportant as a basic cause of accidents, to justify the employer (because of the state of safety-mindedness which it creates in the minds of his workers) to have the working places 100 per cent safe."

Primary Causes of Accidents

Granting that accidents are caused, and that we must know the cause in order to prevent them, it is indicated that there must be some system by which to compile the information

in an orderly and effective fashion. Mr. Pickard, for example, recommended a schedule of thirteen primary general causes of accidents.

1. Falls of persons.
2. Falling objects.
3. Moving objects, not falling objects.
4. Flying objects.
5. Hand handling objects.
6. Striking against objects not being handled.
7. Stepping on objects.
8. Handtools.
9. Haulage.
10. Commercial traffic on docks.
11. Machinery.
12. Fire, hot, poisonous and corrosive substances.
13. Physical violence, illness, and occupational diseases.

With this as a skeleton outline, the safety engineer may list under the separate headings anywhere from one to several detailed or specific causes, relating to operations, conditions, or equipment, which may be peculiar to the special place or job. With this data at hand, the safety supervisor can quickly assemble data on gear, such as slings, strongbacks, hatch covers, booms, hatches, chutes, conveyors, jitneys and trucks, winches, etc.; or relative to haulage, stowage, or the repairing or handling of gear.

Further refinement of the accident analysis would include the tabulation of secondary or contributory causes, based on what was actually responsible for the non-prevention of the accident; in other words, the principal reason for the non-prevention of its occurrence.

Contributory Causes Analyzed

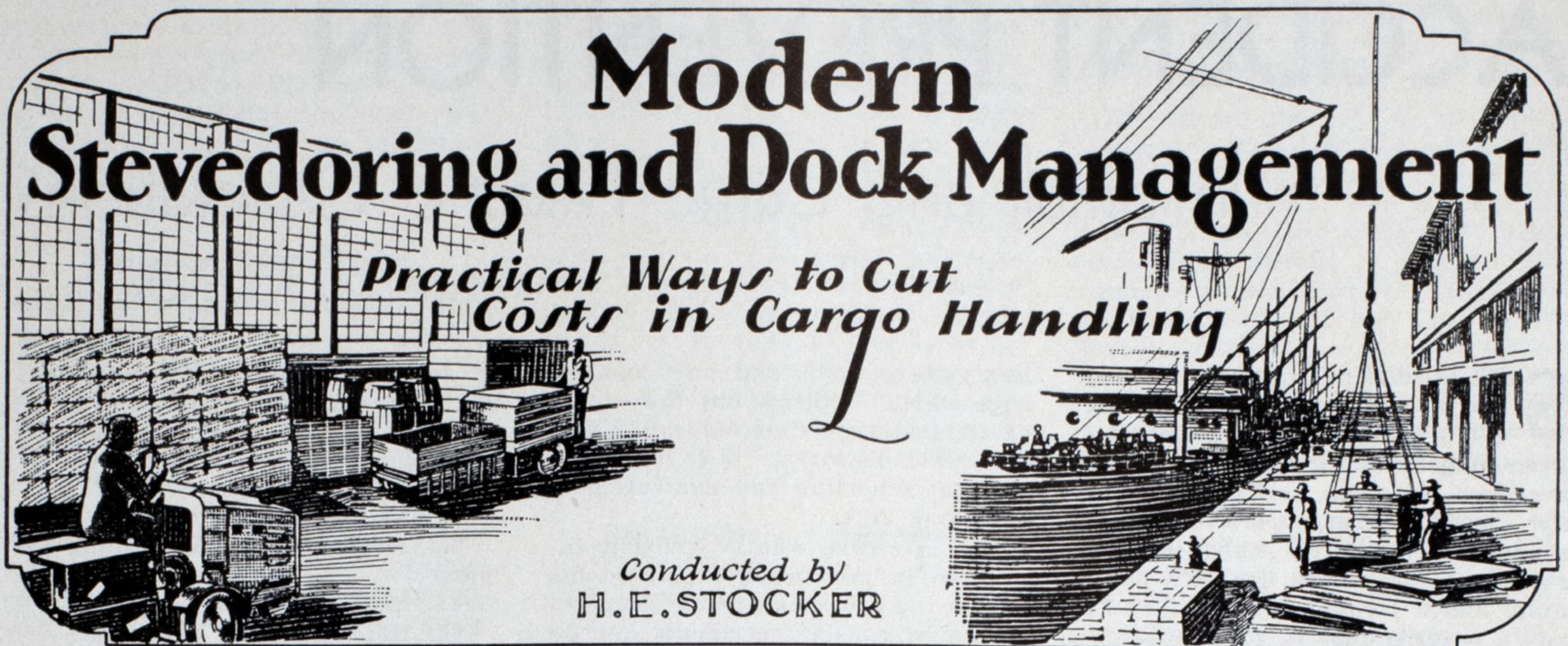
These contributory causes may be divided into three major headings—weather, gear (or mechanical), and supervision.

Under gear, there may be listed gear failures and unguarded machinery.

Under supervision, there may be listed:

1. Correctible working conditions, such as lights, poor housekeeping, and congestion.
2. Lack of organization.
3. Tolerated unsafe practices, such as poor loads, or overloads, stowage, improper or poor tools or gears.

(Continued on Page 40)



Modern Stevedoring and Dock Management

*Practical Ways to Cut
Costs in Cargo Handling*

Conducted by
H.E. STOCKER

Terminal Operations at Canal Zone

Speed up Vessel Despatch

By Gerard E. McNamara

THE Panama Canal Zone is one of the foremost transhipment points in the world. All lanes of traffic converge on the canal, passing from the west to east, bringing manufactured goods to be exchanged for the silks and other merchandise of the Orient. Goods are also consigned to the Canal Zone for use there and in the Republic of Panama.

Cargo is consigned "canal zone for orders", and those orders might send it to any part of the world. Coasting steamers arrive loaded with freight for ocean-going vessels which make Cristobal and Balboa ports of call. These liners in turn bring cargoes for the coasters. Goods are exchanged, transshipped, received, and shipped in every conceivable direction. The volume of this tonnage reached a maximum in the fiscal year ended June 30, 1929, when it amounted to 1,559,311 tons. Then it dropped off to 989,534 tons in the

fiscal year 1932, but since has been steadily increasing so that for the last six months of 1934 the amount was 616,876 tons.

Diversified Cargo Handled

To handle this diversified cargo efficiently requires superior equipment and facilities. The greater part of the cargo consigned to the Canal Zone is either "in transit" or "for orders". This means a great deal of handling to and from the sheds which serve as temporary warehouses. Freight must be picked up at the hook of the ship, taken to a point of storage within the pier shed, and then picked up again and brought to the loading gear of another vessel.

The great number of handlings necessitated calls for equipment sufficiently flexible to meet every situation. The excellent facilities provided at Cristobal and Balboa has earned for these twin ports a favor-

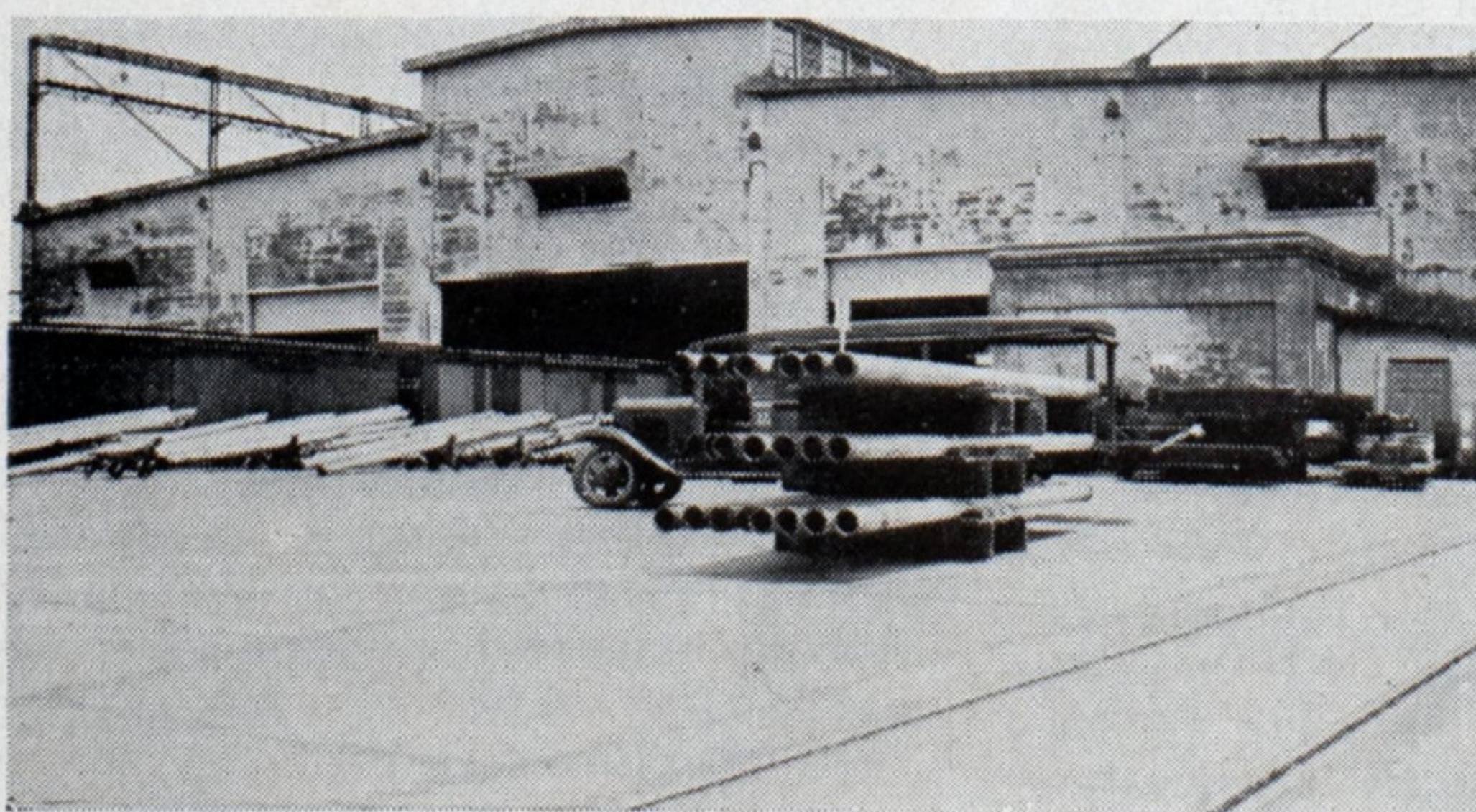
able reputation for efficiency the world over. For speed and economy, the Canal Zone ports cannot be surpassed by any other anywhere.

Exports are, in the main, bagged goods and bananas, the former being comparatively easy to handle while the latter requires special care. The imports show a wide range in variety, cased goods, bulk commodities, liquids, metals, etc.

Colon Coastwise Piers

In the port of Colon, adjacent to Cristobal harbor, the Panama Railroad Co. owns two piers and a wharf of timber and pile construction. These units are under the same management as are the piers at Cristobal. The accommodations at Colon are not particularly important but they have a place in the complete picture of the facilities available at the Atlantic terminal of the canal.

Pier No. 1 is a wharf type structure, 250 feet long and 250 feet wide, with a total berthing space of 500 feet and a depth of 27 feet alongside. It has no transit shed and is suitable for discharging coastal steamers carrying bulk cargoes, freight subject to immediate removal and goods not subject to weather damage. No. 2 dock is 360 feet long and 50 feet wide and has a total berthing space of some 700 feet, with 27 feet depth of water alongside. The transit shed has a capacity of 16,500 square feet. Pier 3 is 550 feet long and 60 feet wide, and has 1160 feet of berthing space. The



Inshore end
Pier 8, Cristo-
bal, C. Z. Note
pipe loaded on
skids. Railroad
cars entering
center of pier
on depressed
tracks

capacity of the transit shed is the same as that on Pier 2.

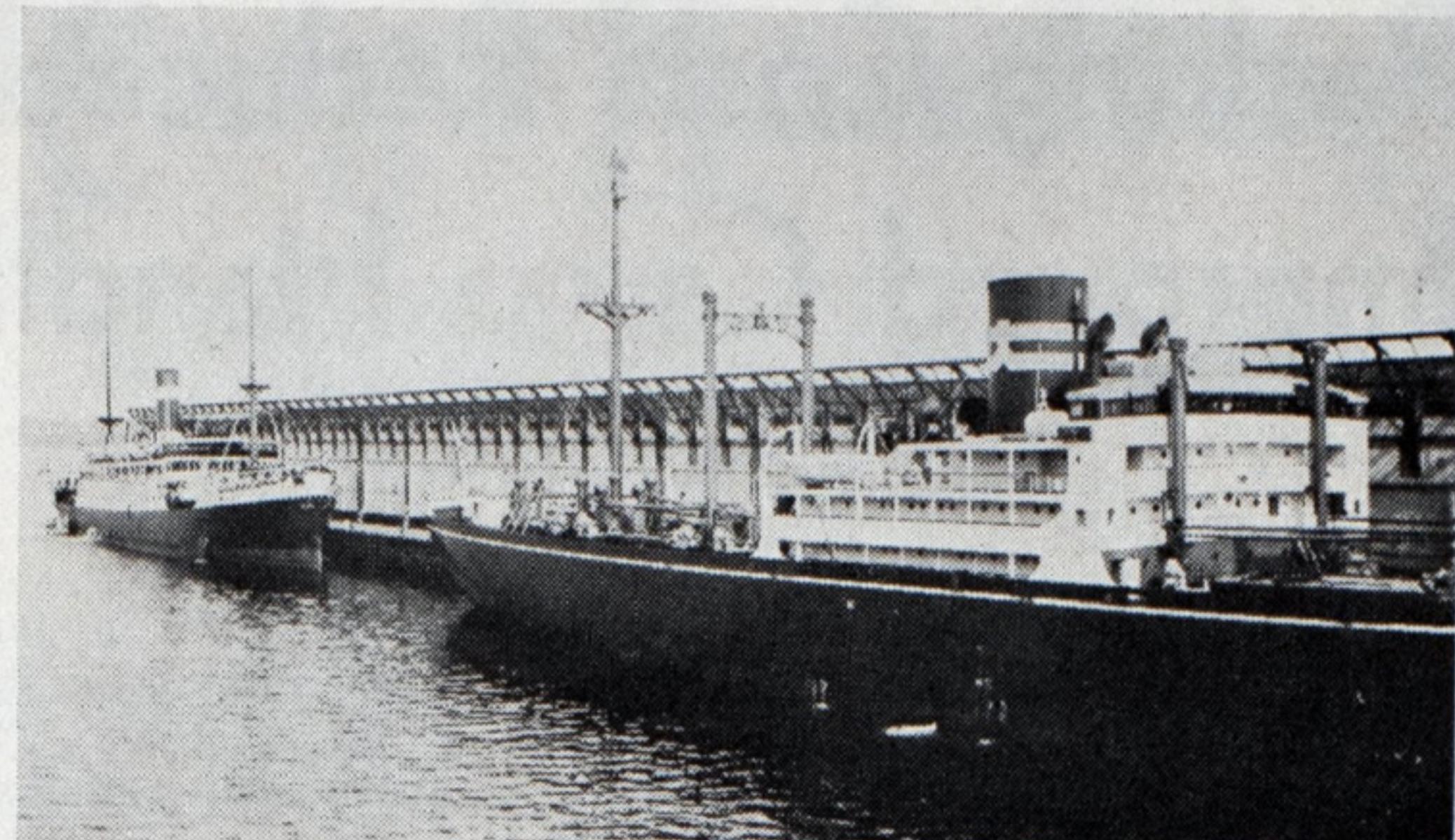
These piers are utilized only by small coastwise sailing vessels. Neither cargo-handling nor railroad connections have been provided, although a single-track line runs along the rear of the piers. The transit sheds serve as convenient warehouses. Ships discharge cargoes at this terminal either for temporary storage or immediate loading into box cars or trucks to be taken to the mains piers at Cristobal. Their chief value to the port district is to serve the smaller vessels which would seriously hamper the operations at the larger piers were they to dock at Cristobal proper. This arrangement works to the advantage of all concerned, although when space is available at Cristobal coastwise vessels sometimes dock there in order to eliminate the haul from Colon.

Facilities at Cristobal

Outstanding among the facilities provided at Cristobal are the splendid modern piers, in the construction of which many materials handling problems were taken into consideration. The provision of various types of equipment have made it possible to meet almost any conceivable cargo handling problem efficiently and economically.

Since the commerce of the two ports is either "in transit" or for local consumption, warehouses are not in demand. Cargo consigned to "Canal Zone for orders", or for transhipment, is stored in the transit sheds of the Panama Railroad piers.

Two ocean vessels docked at Pier 7, Cristobal, C. Z. Cargo masts overhang apron about 8 feet, along entire length of shed



one point of entrance or exit by land. The piers are all covered and are connected by an open marginal roadway which runs along the inshore ends of the piers. This roadway is paralleled by railroad tracks having suitable connections to each pier and to the freight yards of the Panama Railroad Co. At the inshore end of each pier there is a large open concreted storage space. There is a similar storage space at the offshore ends of the piers.

The general rule at Cristobal is that ships from South and Central American ports, landing such cargoes as coffee, cocoa, wood, hides, copper, etc., should be discharged at Piers 6 and 7. Such cargo is nearly all transshipment freight to be delivered to other ships and can be handled most economically by means of industrial equipment. Piers 8 and 9 are used for discharging vessels from the United States, bringing in addition to transfer cargo, large quantities of

freight for the Republic of Panama and the Canal Zone, all of which has to be loaded into cars, for which the depressed tracks are essential for economical handling.

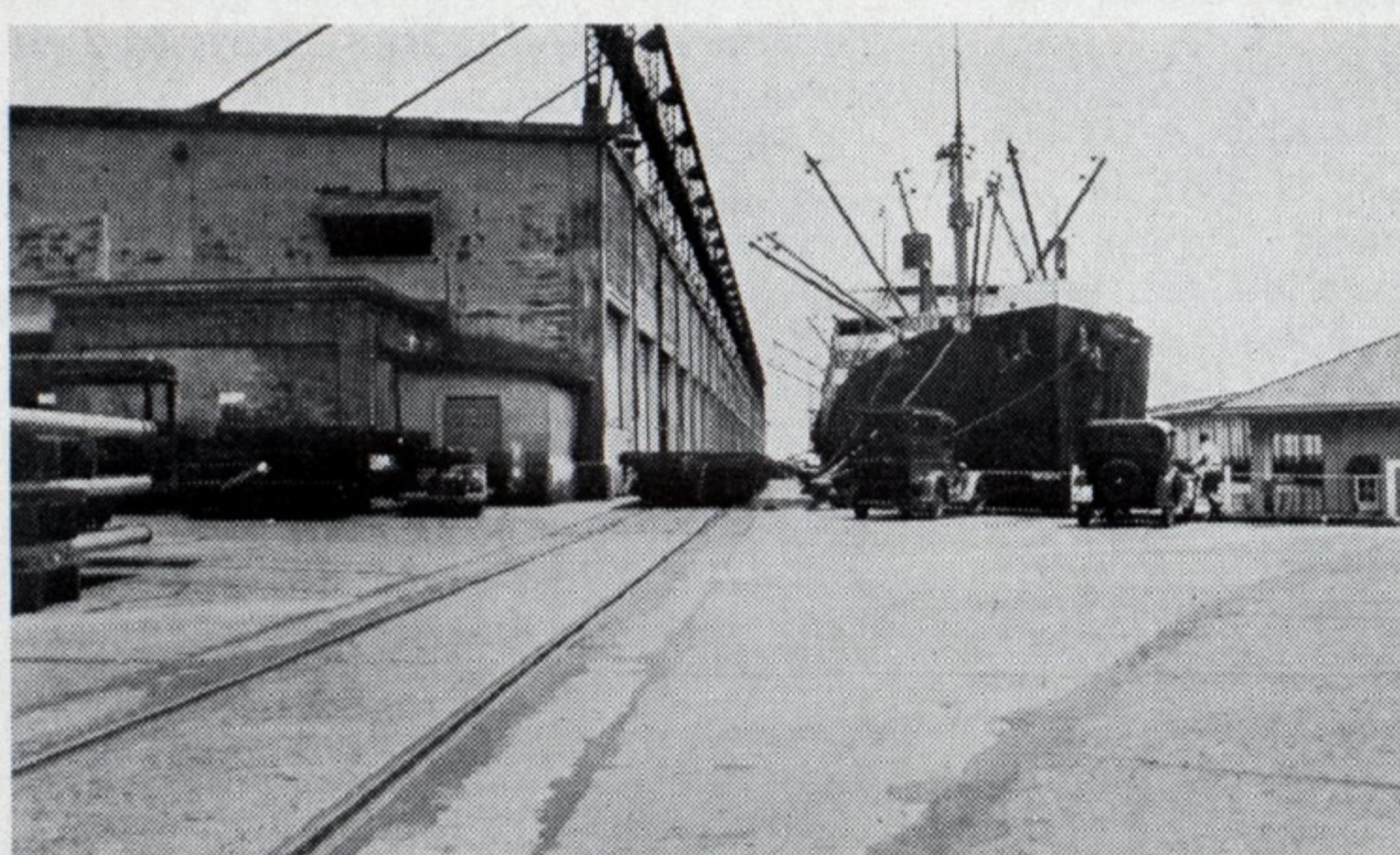
Pier of Steel and Concrete

Pier 6, which is of steel and concrete construction, has an upper side length of 1158 feet, is 1130 feet long on the lower side, and has a width of 227 feet. It is covered by a steel shed, 160 feet wide and 945 feet long, having a total capacity of 150,400 square feet. It offers 2482 feet of berthing space in 37 feet of water. On each side of the shed roof, cantilever arrangements are anchored to tracks in such a manner that they may be placed in desirable locations for the use of vessels the booms of which are inadequate to reach the apron of the pier.

A single track runs down the full length of each side of the pier apron at floor level, which permits the free use and movement of industrial equipment. On the offshore end of the roof of the transit shed, there is a signaling station and tower. This station receives word of the approach of all ships to the terminals and makes that information known by hoisting suitable signals.

Railroad cars can be spotted on the tracks alongside the hatches of the ships and freight delivered direct or from the cars without touching the floor of the pier. Wooden horses are placed outside the doors of the cars and a platform is laid over these sup-

(Continued on Page 38)

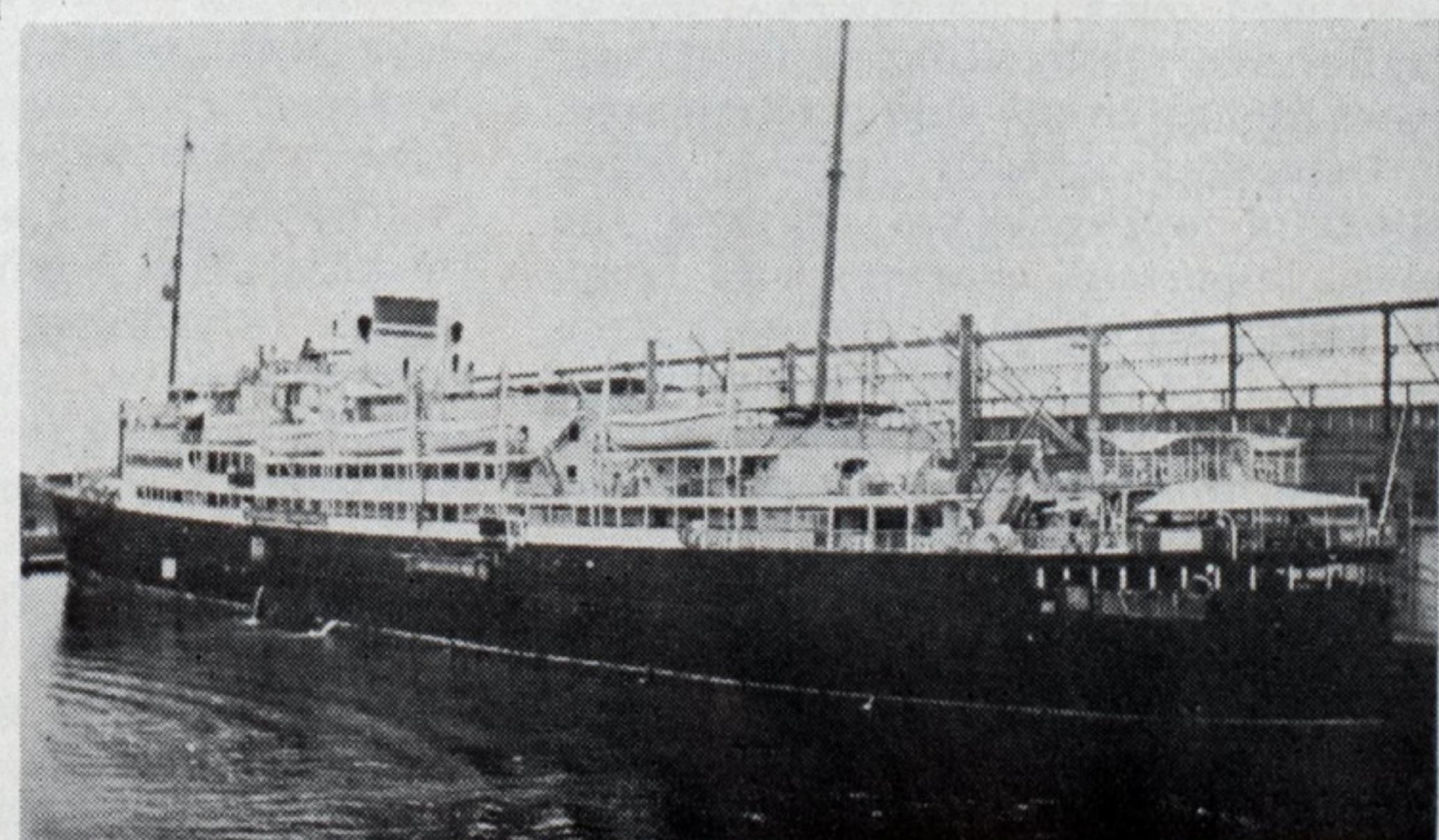


S. S. Cristobal at Pier 8, Cristobal, C. Z. Single, floor level track down the apron. Flat cars for hauling heavy loads

The port facilities have been constructed on a long peninsular-like strip of land which points out almost due west from the mainland. The piers are constructed diagonally along this narrow peninsula, there being three piers and two wharves within the one enclosure, and, as far as pier operations are concerned, under one head.

This type of construction makes it comparatively easy to control the exit of goods and passengers from the wharf enclosure because there is but

Italian Motor-ship Orazio at Pier 8, Cristobal, C. Z., bound from Genoa. Note superstructure on the pier



Packing Costs Reduced by Improved Cargo Handling

By H. E. Stocker

MODERNIZATION of cargo handling methods has progressed steadily within recent years with the result that shippers have reduced costs as well as the shipping companies because better handling methods have reduced the hazards of marine transportation, permitting the shippers to use less expensive packing to provide adequate protection.

Formerly the net sling was used for the handling of cases and drums, rolls of Kraft paper, etc. The uneven piling of the packages in the net sling, with the pressure of the packages against each other, particularly corners against sides, caused damage. In order to avoid this damage shippers had to provide comparatively expensive packing.

The old methods of handling cargo involved repeated rehandling of individual cases. Each handling was a hazard and much damage resulted.

Platform Sling An Improvement

The development of the platform or airplane sling was a decided improvement. When of proper design, it eliminated the damage that resulted from the use of a net sling and when used in conjunction with good terminal equipment it reduced the number of handlings of individual cases.

The net sling was lowered onto the terminal dock. The cases were in a jumble; it was necessary to pick up the individual cases and load them on to a truck. This caused delay, expense and damage. On one terminal, within a short period of time, damage to cargo was reduced 66 per cent by the substitution of platform and pie plate slings for net slings and by exercising a little commonsense in the handling and stowage of cargo. With a platform sling, the slingload is landed on a four wheel truck or trailer and the handling of individual cases alongside the ship is eliminated.

Damage is greatly reduced when slings of proper design are used, the most important characteristic being spreaders which keep the ropes from cutting into the cases and spread the pressure of the ropes over a larger surface to prevent crushing of the cases.

The pie plate sling was another development which reduced damage and handling costs by reducing the number of times the cargo was handled. Drums of oil which must

be delivered in perfect condition require something safer than a net or a barrel sling. The pie plate sling solved this problem very effectively. Drums are loaded in the pie plate sling in the ship and remain on the sling until the truck or trailer reaches the pile on the pier.

The platform sling, however, is now obsolete for many classes of cargo. The pallet fork truck method is far more economical from every point of view. The pallet is loaded in the ship and the cases remain on the pallet until delivery is made to the consignee. This method eliminates handling at the pile because the cases remain on the pallets until delivery is made to the consignee's truck, or until loaded into car or barge. The ultimate objective is to leave the cargo on the pallets while it is being handled from the terminal to the warehouse of the consignee and while it remains in the warehouse. This objective has been obtained in handling various commodities and it can be extended when and as the usual resistance to new ideas disappear, as the facts of economies achieved by using the pallet fork truck method become better known.

Damage to Cargo Reduced

Improved cargo handling methods having reduced the hazards of transportation, the shipper is able to use less expensive packages. It was necessary, once, to provide a "good strong package" to protect the merchandise from the rough treatment it received while being transported from shipper to consignee. The old fashioned baggage smasher had his counterpart in the handling of cargo.

The author recently reduced the packing costs on one commodity, an amount equivalent to 17 per cent of the freight charges, by providing only such protection as is necessary under present conditions of modernized cargo handling.

The crating of machinery was substituted for boxing, with another saving in packing. The author found that machinery was being boxed as if it were going to be subjected to all the hazards of transportation in some remote section of South America. In the future, other commodities will be shipped in fiberboard cases instead of in wooden cases, reducing packaging costs still further and at the same time providing cases thoroughly ade-

quate for the transportation of the contents.

The operating departments of shipping companies that have improved their methods of handling cargo can increase the traffic handled by their companies by bringing these improvements to the attention of the traffic department, who in turn may bring them to the attention of the shippers. There is no better way to sell the services of a company than to save the shipper money.

Packing Costs Cut

In one case an attractive tonnage of printing paper was obtained by cooperating with the shipper in reducing his packing costs. In another case improved cargo handling methods made it possible for the shipper to use a cheaper package for canned goods. It was found that a lighter case adequately protected the shipments. Many other examples could be cited showing how shipping companies can increase profits or cut losses by utilizing modern methods of handling cargo and "selling" the advantages of modern methods to the shippers.

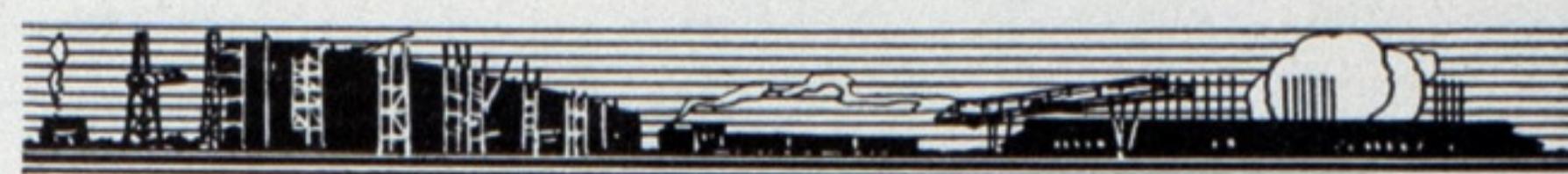
British Naval Architects In Annual Meeting

The meetings of the Institution of Naval Architects were held in the Lecture hall of the Royal Society of Arts, Johns street, London, on April 10 11 and 12.

At the professional meetings, 11 papers were presented as follows:

1. *Launch of the Quadruple Screw Turbine Steamer QUEEN MARY*, by J. M. McNeill, member.
2. *Transport of Refrigerated Cargoes under Modern Marine Practice*, by A. R. T. Woods, member.
3. *Channel Train Ferry Steamers for the Southern Railway*, by Sir Westcott S. Abell, vice president.
4. *Resistance Experiments in Smooth and Rough Water Made with Models of High Speed Ships*, by J. L. Kent, member and R. S. Cutland.
5. *A Simplified Form of Direct Flooding Calculations* by J. L. Scott, member.
6. *Steamships with Main Boilers on Deck*, by K. G. Meldahl.
7. *The Evolution of the Modern Steam Trawler with Superheater*, by W. H. C. Nicholas, student.
8. *The Corrosion Problems of the Naval Architect*, by Dr. W. H. Hatfield.
9. *An Experimental Investigation of Cracking in Mild Steel Plates and Welded Seams*, by Prof. E. G. Coker, associate, and Prof. B. P. Haigh.
10. *A Standard of Stability for Ships*, by Prof. E. Pierrottet, member.
11. *Ship Wave-resistance—Progress Since 1930*, by W. C. S. Wigley, associate.

Useful Hints on Cargo Handling



AT THE Norfolk terminals of the Norfolk and Western Railroad Co., existing facilities are utilized in a most efficient manner. Ships tie up at the pier and discharge large quantities of freight from every inshore sideport direct to the pier.

This cargo is stacked in sections and later loaded in cars spotted on tracks on the pier. All city (Norfolk) and truck delivery (city and longdistance trucking companies) freight is loaded on trailers and hauled to a 'local' delivery shed situated at the heads of the pier.

The offshore ports are also worked in the following manner. Two long lighters reach from one sideport to another. Abreast of these, and also on the ends, are placed lighters belonging to the various railroads scheduled to receive freight from the ships that are discharging. The cargo is taken out of the steamers on hand trucks and on tractor-trailer trains, and is taken across the transfer lighters to the railroad lighters which are later towed to the railroad terminal by tugs.

This methods insures a speedy discharge of cargo as freight is moved from every available sideport in the vessel.

Odors Contaminate Flour

ASHIPMENT of flour was damaged by odors from a shipment of fertilizer stored nearby in a pier shed, although the shed was opened on three sides.

In another case, flour stored in the lower hold was damaged by creosoted piling stowed on deck. Shiploads of flour were hoisted across the piling and it is thought that contamination occurred in the brief moment of transfer from hold to dock.

To be on the safe side all odors must be kept away from flour.

Night Work is Inefficient

THE decreased efficiency of night work as compared with day work is often not fully realized. If regular gangs are worked all night, their efficiency is decreased because of fatigue and night working conditions. On the other hand green substitute gangs are even worse. The greatest economy both

THIS page is being devoted to short items on all matters having to do with the more efficient turnaround of ships. These items are intended to be of a helpful nature.

We will welcome for this page brief descriptions, illustrated if possible, of any better or safer way of performing any function in cargo handling. Also, any questions submitted will be answered by the editor.

in money and ship's time is obtained by careful planning of the work to minimize or to eliminate all the night work and by using experienced workers and efficient ship and dock gear.

When night work is unavoidable it is of the utmost importance for effective results to provide adequate lighting. In this way not only is better work done but it is also essential as a safety measure.

Investigation of damage to flour by a steamship company disclosed that the damage attributed to the steamship company was actually caused by smoke which got into the railroad cars during the trip through a long railroad tunnel.

A Baltimore shipper has a monorail hoist mounted on a motor truck for unloading heavy cases at railroad and steamship terminals.

Avoiding Pier Congestion

ONE method of solving the problem of congestion on small piers is suggested by the practice of one steamship line berthing at the port of New York. This company leases two adjacent piers. The steamer arrives daily at about 4 p.m. and is docked at the south side of the northernmost of the two piers. Passengers and rush shipments are discharged at once, and the ship is made ready for unloading the remainder of the cargo.

The longshoreman gang comes aboard at about 7 p.m. The discharge of freight is through sideports and is generally completed by about 2 to 4 a.m., depending upon the

tonnage of the cargo. The ship is then worked across the slip to the north side of the southernmost pier. The discharged cargo is placed in sections on the inshore end of the pier and in the platform house, that end of the pier that borders on the marginal street. Freight is also stacked in the second story of this shed, conveyors being used for this movement. Since the ships are not equipped with booms, it is impossible to discharge direct into the second story.

By operating in this manner, congestion caused by trucks picking up freight at the same time that freight is being delivered for the outbound trip or is being loaded into the ship is eliminated. The night operation also does away with the practice of truck pick-ups of cargo while it is being discharged, an important factor in the relief of pier congestion.

Unless the tonnage is very heavy, loading of the ships for the southbound run does not start until morning. Freight for the sailing has been received from the time the previous ship sailed, at about noon the day before. As the freight is received from trucks it is piled on trailers directly from the tailboards. The trailers are lined up at the offshore end of the pier, ready to be taken into the ship when loading is under way. Sometimes these loaded trailers are taken into the ships as soon as they move over to the outgoing berth, or sometimes in the early morning, so as to make the trailers available for use in handling freight received during the morning.

Carload shipments are not handled directly on to trailers as this would require too many and would also waste too much space. Such lots are loaded and tiered on the pier floor and broken down when ready for loading.

Each checker on the pier is equipped with a desk mounted on wheels. This desk is moved to the tailboard of each truck and greatly facilitates the work of the checkers in receiving and delivering freight.

Power costs of mechanical appliances for handling cargo are not relatively important. The place to employ economy is in the effectiveness of the equipment to accomplish the transportation desired..

Up and Down the Great Lakes

Lake Superior Open—Lease Coal and Ore Docks —Lake Levels—Coal Shipments are Heavier

SHIPMENTS of Lake Superior iron ores from Lake Erie ports during the month of March were slightly greater, according to statistics issued by the Lake Superior Iron Ore association, being 298,780 tons this year as compared with 204,900 tons during March a year ago.

For the season of 1934, receipts of ore at Lake Erie ports were 15,572,523 tons as against 16,323,050 tons during the season of 1933. Ore shipped from the lake ports during the season to April 1 totaled 11,783,677 tons against 12,353,706 tons for the same period in 1934.

Ore remaining on docks at lake ports on April 1 this year was reported as 4,569,298 tons, compared to 4,981,536 tons on April 1, 1934.

Tankers Begin Operation

The port of Chicago was opened for the 1935 season when the tankers GENERAL MARKHAM of the Cleveland Tankers Inc., under command of Capt. Fred Robbins, and the CRUDOIL of the Allied Oil Transport Co., under Capt. Roy McFarlane, arrived at that port April 5.

The tankers left Cleveland April 1 and made the run in about three and a half days. They encountered ice at the Straits of Mackinac but followed a channel cut for them by the coast guard cutter ESCANABA. Their passage through the straits was about a month earlier than usual.

Vessel Names Changed

The Wilson Transit Co. steamer H. P. MCINTOSH has been rechristened the EDWARD S. KENDRICK. The new name is in honor of the president of the Inland Coal & Dock Co.

The so-called Poker fleet, ACE, KING, QUEEN, JACK and TEN has had a new addition in the steamer formerly named GILTEDGE and which now becomes T.F.N. The vessel formerly named TEN now becomes NINE. The newcomer to the fleet opened the package freight service in sailing on April 20 from Duluth bound for Detroit and Buffalo. The NINE will serve mainly as an auxiliary to the main fleet.

On April 17 the freighter L. M. BOWERS of the Tomlinson Steamship Co. was rechristened the CHARLES E. DUNLAP after the president of the Ber-

wing-White Coal Mining Co., New York.

By April 20 final government ice reports indicated the breaking up of ice generally on the lakes and that the principal ports and waterways were then open for navigation.

March Lake Levels

The United States Lake survey reports the following monthly mean stages of the Great Lakes for the month of March, 1935, determined from daily readings of staff gages.

Lakes	Feet Above Mean	Sea Level
Superior	602.25	
Michigan-Huron	577.78	
St. Clair	572.76	
Erie	569.80	
Ontario	243.45	

Lake Superior was 0.13 foot lower than in February and it was 0.14 foot above the March stage of a year ago.

Lakes Michigan-Huron were 0.08 foot higher than in February and they were 0.34 foot above the March stage of a year ago, 0.92 foot below the average stage of March of the last ten years.

Lake Erie was 0.29 foot higher than in February and it was 0.21 foot above the March stage of a year ago, 1.44 feet below the average stage of March of the last ten years.

Lake Ontario was 0.26 foot higher than in February and it was 0.23 foot below the March stage of a year ago, 1.82 feet below the average stage of March of the last ten years.

Lease Coal and Ore Docks

The coal and ore docks of the Baltimore & Ohio railroad at Lorain, O., and Toledo, will be operated by the Toledo, Lorain & Fairport, Co., subsidiary of Oblebay-Norton & Co., according to C. W. Galloway, vice president in charge operation and maintenance of the railroad, who made the announcement that a lease had been signed on April 9 giving operating rights to the new company after April 16. This deal leaves only three docks at southern Lake Erie ports to be operated by railroads, all the rest now being operated by stevedore companies either inde-

pendents or subsidiaries of steamship and other interests.

The Baltimore & Ohio dock at Toledo has a storage capacity of 500,000 tons and is equipped with two Hulett electric unloaders with 15-ton clam shells, with a rated unloading capacity of 1000 tons per hour. There is also one Wellman Engineering Co. car dumper, having a rated capacity of 1500 tons per hour.

At the Lorain, O., ore dock, there are three Brown electric unloaders with 15-ton clam shells and an unloading capacity of 1000 tons per hour and a storage capacity of 350,000 tons. A 2000-ton-per-hour McMyler car dumper is also installed on this dock. A special rig on this dock, equipped with a hopper, permits self-unloading vessels to unload direct into railroad cars.

Navigation to Upper Lakes

What might be termed the formal opening of the bulk carrying trade on the Great Lakes took place on April 19 when the steamer MICHIGAN of the Cleveland Cliffs Iron Co. arrived at Duluth with a cargo of coal from Lake Erie.

On the same day the steamer J. H. SHEADLE opened the ore carrying season by loading a cargo of ore at the Great Northern Ore dock, Superior.

After these initial cargoes the season was expected to get into full swing promptly.

Coal Shipments Heavier

Coal shipments to lake ports are much heavier this year than a year ago, according to figures issued by the Ore & Coal Exchange.

From Jan. 1 to March 31 a total of 392,427 short tons of cargo coal was loaded on vessels at coal loading docks as compared to 156,917 short tons for the same period last year, and 203,731 short tons in 1933. The amount of fuel coal was double that of last year, being 6706 short tons as against 3247 tons last year, and 3201 tons for the same period in 1933.

Various sections of the New York State canal system were formally opened April 8, April 15 and May 1.

Weaver Discusses Subsidy at Propeller Club Dinner

Joseph B. Weaver, director of the bureau of navigation and steamboat inspection, had an attentive and sympathetic audience in his clear cut and convincing address on the American merchant marine at the annual spring dinner of the Propeller club, port of Cleveland, April 18. He outlined the principal features of the bill which is now being introduced in the congress to effectuate the merchant marine policy laid down in the President's message of March 4, and declared that he knew of 24 general cargo and passenger vessels and 18 high speed tankers that will be laid down if the proposed ship subsidy legislation is passed.

"Private initiative with the free play of individual enterprise," he said, "is necessary to establish and maintain an adequate and efficient merchant marine in foreign trade.

We have not yet arrived at that stage in this country where it would be possible to accomplish these objectives by government ownership and operation."

Referring to mail contracts he said, that while some of these were ill advised and their administration had been far from what it should have been, the majority of the lines have complied strictly with the terms of their contracts, have paid their obligations in full when due and have built and maintained in operation a considerable fleet of fine modern vessels. "If the mail contracts are cancelled," he said, "without an adequate substitute measure along the lines of the proposed new legislation, many American ocean going lines will be forced to curtail or abandon established services."

He particularly emphasized the fact that the new legislation will separate the functions of determining and negotiating aids to be received and the administration and

supervision of the disbursement and use of such aids. Furthermore, that the new law is explicit in providing the constituted authorities in the legislative branches with detailed information concerning all contracts.

He spoke at some length on the plan to establish schools for the training of seamen and the introduction of continuous discharge books in which the record of every seaman will be noted. To this arrangement he said there has been and can be no objection from any honest man. He mentioned long range studies which are to be carried out on various phases of the shipping industry such as scrapping, plans for superliners, and the tramp trades.

A vote was taken by the members of the Propeller club and unanimously carried that the club is of the opinion that bulk freighters on the Great Lakes should be exempted from the regulations proposed for shipping generally in the Eastman bill now pending in the congress.

Rhododendron, Twin Screw, Diesel, Lighthouse Tender

THE NEW, shallow draft, twin screw, diesel engined lighthouse tender RHODODENDRON, shown in the accompanying illustration, built by the Commercial Iron Works, Portland, Ore., for the lighthouse service of the department of commerce, was launched March 17 and completed April 10. She was especially designed for operation on the comparatively smooth but swift waters of the Columbia and Willamette rivers including all the area from Astoria at the mouth of the Columbia to the head of navigation.

Her principal activity is attending lights, buoys and other navigational aids. At many points the depth of water is extremely shallow but not less than four feet. To meet this condition she is of twin screw, tunnel stern type. Special care was taken in the design and construction of the tunnels to obtain a smooth even flow of water and an adequate but not excessive seal at aft end.

The hull and houses are of steel with wood sheathing in the quarters. Accommodations are provided for seven men.

There is a 5 horsepower, 3-drum winch serving one 1½-ton, 25-foot boom. The fore mast and boom are of steel tubing. A hatch six feet square gives access to the hold. The mast is stepped well forward in order to make lifts beyond the bow when

working in very shallow water.

Principal characteristics of the RHODODENDRON are: length over all, 80 feet, 9½ inches; length between perpendiculars, 80 feet; breadth molded, 19 feet; depth molded 5 feet, 11 inches; draft light, 3 feet, 8 inches; displacement loaded, 100 tons; diesel fuel oil bunker capacity, 9 tons. Her speed is 11 knots.

The propelling machinery consists of two, 6-cylinder, 4-cycle, solid injection Atlas Imperial diesel engines, of 7½-inch bore and 10-inch stroke. Each engine is direct connected to a propeller and develops 120 horse-

power at 400 revolutions per minute. For heating purposes there is one, oil fired, 22 square feet heating surface, American Radiator Co. boiler.

Electric power is supplied by one 10 kilowatts Troy Engine & Machine Co. generator, driven by a 15 horsepower, 2-cylinder, 5 x 7 inches, Hill diesel engine. Other equipment includes pumps by Worthington Pump & Machinery Corp. and Fairbanks-Morse Co.; windlass by Allan Cunningham; refrigeration by Kelvinator Co.; galley range by Ingle Mfg. Co. The propellers were furnished by Coolidge Propeller Works, Seattle.



Rhododendron, shallow draft, twin screw, diesel engined Lighthouse Tender, built by Commercial Iron Works, Portland, Oreg. Completed April 10

Foreign Shipping

(Continued from Page 11)

promptly damaged by the Anglo-Argentine trade agreement which was concerned mainly with meat. Then came the plea of the home farmers that they ought to be protected from the importation of meat from overseas and altogether things were in a pretty muddle. It is particularly hard on the New Zealand section of the trade, for the prosperity of the Dominion depends almost entirely on meat and New Zealand has led all the other sections of the British commonwealth in reducing the tariff on goods imported from Britain.

It has been mentioned that the

new fleet of meat ships built for the New Zealand and Australian service by the New Zealand-Federal line, the Commonwealth & Dominion line, Shaw Savill & Albion line and the Blue Star line are motorships, the smaller bunkers demanded by the diesel being regarded by the owners as an overwhelming advantage when it comes to driving a big ship at high speed over the longest trade route in the world.

The Clan line, which is building a ship of similar size for its Australian run, takes the opposite view and is getting 16 knots with steam, twin screw triple expansion engines with Bauer-Wach exhaust turbines. It is an interesting experiment, especially as her boilers will be coal-fired, but

it is understood that the reason is largely to reduce the turn-around time in port which is apt to be prolonged by the necessity of overhauling big diesels. In any circumstances it will be of interest to compare her performances with the motorships.

Another point in which steam appears to have won a useful victory in its usual keen competition with the diesel engines is in the recent decision of the Rotterdam Lloyd line. That concern has a number of fast cargo liners on service between Holland and the East Indies, and recently several of these have been improved and accelerated by having their original turbine engines replaced by diesels. But in the last to undergo the operation, which has just been taken in hand, it has been decided to use steam machinery with high pressure Sulzer boilers which only occupy a fraction of the space demanded by the old Scotch type and work at ten times the pressure. It is significant that a firm so intimately associated with the diesel business as Sulzer is going in for steam nowadays, but it is the same with other firms which were formerly regarded as being irrevocably connected with the diesel, Burmesiter & Wain of Copenhagen for one.

High Pressure Steam

Another particularly interesting high pressure steam installation is that of the 18,000-ton Hamburg American liner POTSDAM which is now being completed for the new express service on the Far East run in conjunction with the North German Lloyd. She will be fitted with Benson high pressure boilers similar to the one carried for the last 4 1/2 years in the Hamburg American cargo ship UCKERMARK, where one Benson boiler at 3000 odd tons pressure has done the work of three ordinary boilers.

On the other hand the Forende Co.'s Scandinavian-American line, which maintains the service from Copenhagen to New York, is selling two out of its three big steamers and proposes to replace the three by two cabin motor liners. Whether this will be carried through or not is at present open to some doubt; it is necessary to apply to the Danish government for help in the matter.

The Soviet government is steadily proceeding with its present program of merchant shipbuilding, constructing a large number of modern motorships but not getting them finished nearly as quickly as the plans dictate. So they are buying second-hand ships in the meantime and have recently acquired a number of all types, from tugs to passenger liners. Most of these have been bought from British or Dutch owners and the Russian authorities are showing themselves willing to give a much more reasonable price and also to pay cash in many cases.

Jasmine, Twin Screw, Diesel, Tender Launched at Pittsburgh

THE twin screw, diesel, steel hull, lighthouse tender JASMINE was launched at the Neville Island yard, Pittsburgh, of the Dravo Contracting Co. on March 26. The sponsor was Miss Virginia Edwards. This vessel is being built for the bureau of lighthouses of the department of commerce. Her home port is to be New Orleans. She will be used for light buoy and supply work in the comparatively smooth waters of the harbors, rivers and inland passages of the Gulf coast, adjacent to New Orleans.

The principal dimensions of the vessel are: Length overall, 91 feet, 4 inches; length between perpendiculars, 82 feet; breadth molded, 23 feet; depth molded, 8 feet, 3 inches; displacement loaded, in salt water, 184 tons. Diesel fuel oil bunker capacity is 1000 gallons. Speed anticipated is approximately 8 1/2 knots.

Propelling machinery consists of two Cooper Bessemer diesel engines. These engines have six cylinders, 8 inches by 10 1/2 inches in size. Each engine develops 100 horsepower at

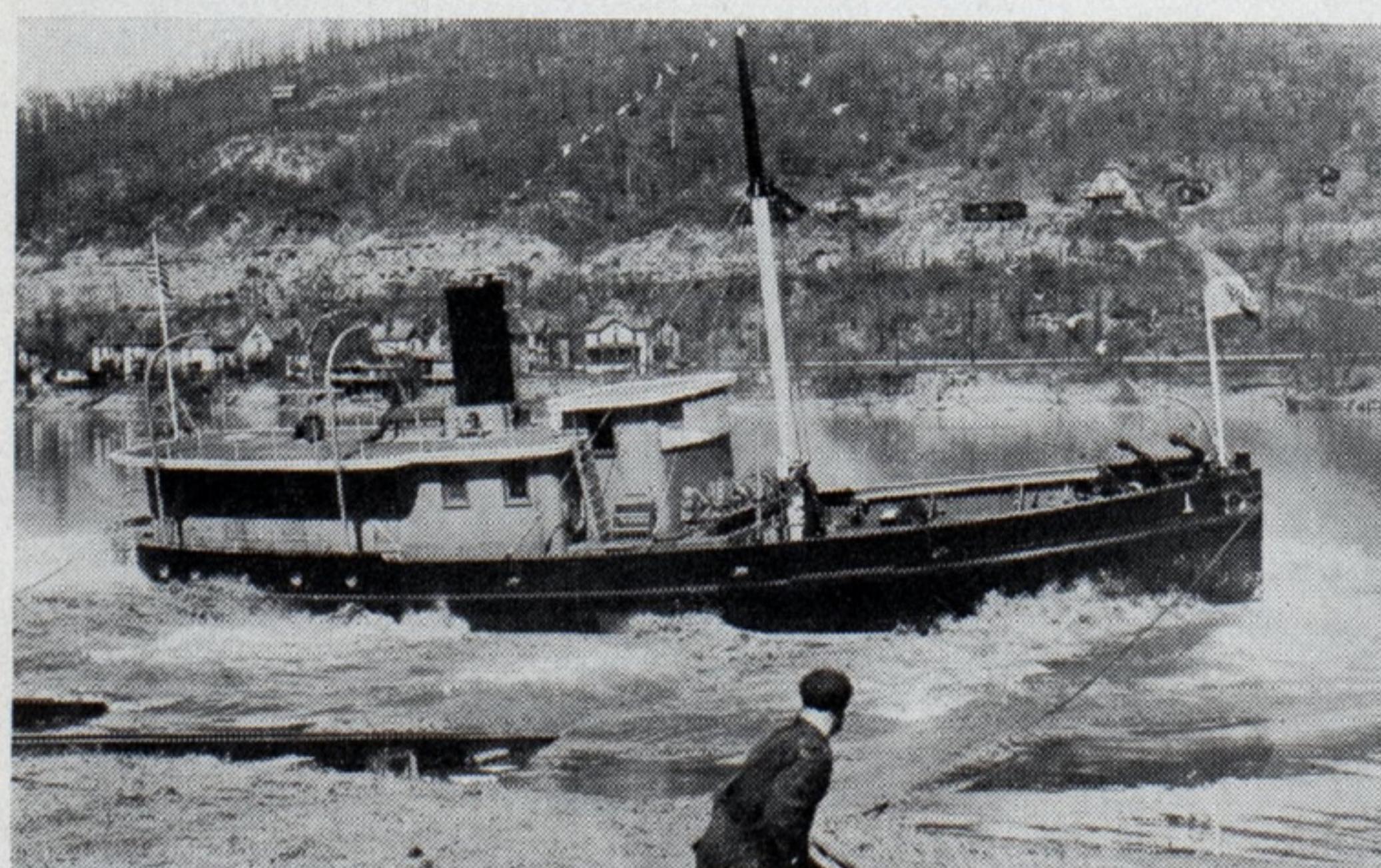
400 revolutions per minute.

There is one heating boiler of watertube type with 77 square feet of heating surface operating at 35 pounds pressure, oil fired, supplied by the Almy Water Tube Boiler Co. The oil burners are of May type.

For handling equipment in service, there is one 7 1/2 horsepower, 3-drum winch furnished by Hyde Windlass Co. This winch serves a 27-foot boom of 2 1/2 tons capacity. Two hatches are fitted, one 6 feet by 8 feet, 3 inches, and the other 24 inches by 30 inches.

Included in the equipment of the JASMINE are an electric generator of Electro Dynamic Co. make driven by a Hill diesel engine; and pumps by Goulds, and Winton.

The windlass was supplied by the Hyde Windlass Co. Hand steering gear of American Engineering Co. make has been installed. The propellers are of Columbian Bronze Co. make. The refrigerator was supplied by the Kelvinator Co., and air compressors by Worthington and Gardner-Driver.



Twin screw diesel Lighthouse Tender JASMINE, launched at the Neville Island yard, Dravo Contracting Co., Pittsburgh, March 26

Personal Sketches of Marine Men

A. J. McCarthy, General Manager, I. M. M. Roosevelt Steamship Co.

By Ben K. Price

KOWN on both sides of the Atlantic, he is widely recognized for his ability as manager of one of America's leading steamship companies.

BEGINNING his career with the Leyland line 37 years ago, he has moved up step by step to the position of general manager.

ALWAYS ready do to his part in advancing the best interests of shipping, he has set a high standard for service to the industry.

ROUNDING out 40 years in ocean shipping, 37 years with one organization, A. J. McCarthy, manager of the International Mercantile Marine-Roosevelt Steamship Co., is well known in shipping circles on both sides of the Atlantic. He is known not only for his activities in the direction of one of the world's large merchant fleets, but also for his effective cooperation with the United States navy during the war and his interest in the American Steamship Owners' association and other organizations engaged in the promotion of ocean transportation. His interest in shipping is broad gage and has included membership on various committees on navigation laws and rules.

For a few years prior to his entry into the shipping business, Mr. McCarthy was associated with the Canadian Pacific railway in the foreign freight department, and had occasion to charter ships for foreign trade routes.

His original affiliation with what now comprises the International Mercantile Marine organization began in 1898 when he was appointed manager at Portland, Me., for the Leyland line. He also served the Leyland line at Montreal, and later as manager at Quebec. In 1915 he was appointed manager of the associated lines of the International Mercantile Marine Co. at Boston.

In 1917 he was transferred to the head offices of the company in New York as a member of the operating staff, and with greatly increased responsibilities. His experience throughout this period was wide and varied in both freight traffic and operating departments.

During the years immediately following, Mr. McCarthy performed notable service in representing his company on the special patrol board of the United States navy in connection with the purchasing and outfitting of many vessels engaged in war activities.

He eventually became manager of the American flag tonnage of the International Mercantile Marine Co., including the well known and successful Panama Pacific line operating large modern American built turbine electric passenger liners in the intercoastal trade.

On April 1, 1931, P.A.S. Franklin, president of the In-



ternational Mercantile Marine Co. announced his appointment as general manager of the company in New York in charge of the operation of all steamers and terminals. In the following year, upon merging of the International and the Roosevelt steamship companies, Mr. McCarthy's duties were extended to include general supervision and direction of the lines managed by the latter company.

The lines now operated by these combined companies are the United States lines Panama Pacific line, American Merchant line and American Pioneer line. These four lines offer passenger and freight services from Atlantic ports of the United States to the British Isles, the continent Australia, India and to the West Indies, Panama Canal and West coast ports. The vessels in these fleets total 326,275 gross tons.

The following are the vessels now being operated by these lines: United States lines: MANHATTAN, WASHINGTON, PRESIDENT HARDING, PRESIDENT ROOSEVELT, AMERICAN IMPORTER and AMERICAN SHIPPER; American Merchant lines; AMERICAN MERCHANT, AMERICAN TRADER, AMERICAN FARMER, and AMERICAN BANKER; Panama Pacific line; PENNSYLVANIA, CALIFORNIA, and VIRGINIA; and American Pioneer line; OLDHAM, NEW ORLEANS, CITY OF DALHART, WARD, CITY OF RAYVILLE, YOMACHICHI, WICHITA, CITY OF ELWOOD, JEFF DAVIS and POTTER. The S. S. COLUMBIA formerly the BELGENLAND, and changed to American register was recently added to the Panama Pacific line for use as a cruise ship.

Affiliated lines also include the Baltimore Mail line and the States Steamship lines. Mr. McCarthy represents his company in the American Steamship Owners' association, and is a member of the executive committee of that association, as well as chairman of the intercoastal group, which he represents on the managing committee of the association.

Mr. McCarthy is also vice chairman of the New York Shipping association; chairman of the committee on operation of marine terminals of the National Fire Protection association.

He is also a member of the Whitehall club, Baltusrol Golf club, and Lake Placid club.

World Shipbuilding Gains, New Orders Increase

GAINS in the volume of merchant vessels of 100 gross tons and upwards being built throughout the world, except Russia, are noted by Lloyd's Register of shipping. A marked increase is shown in the volume of new orders on which work has been begun.

In all, 1,269,534 gross tons of merchant vessels are now under construction throughout the world and of this amount, 43.8 per cent is being built in Great Britain and Ireland, as compared with 47.7 per cent at the end of the December quarter. The share of the United States in the World's output is only one and one half per cent.

Construction in gross tons during the last two quarters is shown in the following table:

	Mar. 31, 1935	Dec. 31, 1934
Great Britain & Ireland ...	555,815	596,834
United States	18,473	20,108
Other countries	695,246	634,785
World total	1,269,534	1,251,722

At this time last year, only 1,079,000 gross tons were being built in all countries.

Of all merchant vessels of 100 gross tons each, and upwards, being constructed in all countries, a total of 848,211 gross tons is being built under the supervision of Lloyd's register, and intended for classification with that society. Of this total, 519,086 tons are now under way in Great Britain and Ireland, and 329,125 tons in other countries.

New tonnage started, and launchings during the last two quarters, are given in the following table of gross tonnage:

New Work

	Mar. 31, 1935	Dec. 31, 1934
Great Britain & Ireland ..	143,097	93,428
Other countries	176,061	108,254
World total	319,158	201,682

Launchings

	Great Britain & Ireland ..	205,792
Other countries	172,026	177,855
World total	278,123	383,647

The volume of production of steam and motor tankers of 1000 gross tons each, and upwards, showed a decline of about 25,000 gross tons during the quarter just ended. This was more than accounted for by the decrease in that type of construction in Great Britain and Ireland.

Tanker construction during the last two quarters, in gross tons, is shown in the following table:

	Mar. 31, 1935	Dec. 31, 1934
Germany	76,765	57,450
Denmark	45,250	52,900
Holland	45,210	40,270
Sweden	42,700	34,700

pared with 61.8 per cent at the beginning of this year. These countries are now building 215,000 tons more of motor vessels than of other types.

Production for these groups of countries during the last two quarters, in gross tonnage, is shown in the following table:

	Great Britain & Ireland	Other Countries
Motor vessels	251,942	464,499
Other types	303,873	249,220
Total	555,815	713,719

Propelling Machinery

Total horsepower of all oil engines being built for marine use throughout the world increased during the last quarter from 697,204 indicated horsepower to 752,442. In this period, Germany's total advanced from 62,135 to 101,960; Sweden's from 80,435 to 90,160; Denmark's from 43,700 to 59,785; and that of the United States from 6830 to 8127. For Great Britain and Ireland, however, there was a decrease from 261,266 to 218,679, and for Japan, from 90,655 to 87,090. Italy's total remained unchanged at 80,700.

Construction of steam turbines throughout the world showed a slight increase in the aggregate shaft horsepower, from 646,601 at the end of December last, to 653,872 at the end of March. For Great Britain and Ireland the total rose from 291,400 to 306,104, and that for Germany from 94,451 to 106,893; while the total for France fell from 224,300 to 210,300.

In the same period the indicated horsepower of steam reciprocating engines for all countries advanced from 102,033 to 121,191. The total for Great Britain and Ireland, however, dropped from 77,858 to 73,826.

United States Ranks Last

While Great Britain and Ireland, Germany, and France continue to lead, in the order named, in the volume of production of merchant tonnage, there were a number of shifts during the last quarter in the ranking of the other shipbuilding countries.

United States fell from ninth to the last place. The relative ranking and production of the various countries is shown in the following gross tonnage table:

	Mar. 31, 1935	Dec. 31, 1934
Motor vessels	716,441	698,768
Other types	553,093	552,954
World total	1,269,534	1,251,722

Great Britain and Ireland are now devoting 45.3 per cent of their construction to motorship building, as against 49.3 per cent at the beginning of this year. In the case of the other countries, taken as a group, motorized construction now represents 65 per cent of the total, as com-

	Mar. 31, 1935	Dec. 31, 1934
Great Britain & Ireland ..	555,815	596,834
Germany	194,770	139,611
France	120,899	120,952
Sweden	83,213	60,140
Japan	79,491	104,640
Denmark	66,640	78,630
Holland	60,371	48,833
Italy	36,800	37,000
Spain	22,492	17,622
Norway	20,620	16,447
United States	18,473	20,103

Six large vessels, of 20,000 gross tons each, and upwards, are now being constructed. Of these five are building in Great Britain and Ireland, and the other in France.

Terminals at Canal Zone

(Continued from Page 29)

ports at a height about equal to that of the floor of the box car. As the cargo is broken out of the car, sling-loads are made up on this temporary platform and hoisted directly into the ship. This method reduces the number of handlings necessary and eliminates all trucking.

Fuel Oil Pipe Lines

Pier 6 is also equipped with two 12-inch fuel oil pipe lines, having branches around docks 7 and 8. The piers are provided with stop valves which permit the oiling of two vessels at any of the docks. There are 13 outlets for fueling.

Pier 7 is also built of steel and concrete. This pier is 1177 feet long and 237 feet wide and contains a transit shed 932 feet long and 164 feet wide, having a capacity of 150,400 square feet. The apron on this pier is 24 feet wide, and there is an open storage space of 17,800 square feet additional at the offshore end of the pier. The berthing space is 2500 feet and there is 37 feet of water. There are 24 outlets for the fueling of vessels docking at this pier.

Single floor-level tracks run down the apron on each side of the transit shed. A fixed superstructure, to which blocks may be attached at frequent intervals overhangs the apron about 8 feet along the entire length of the shed. This superstructure is a variation of the type of cargo mast known locally as the "monkey rail". This mast, when rigged to a two-ton electric winch, effectively replaces the ship's outboard boom and one winch. The importance of this feature is appreciated when working ships with short booms.

The ordinary merchant vessel is equipped with but two booms to a hatch. At such times as speed is vitally essential, both booms can be placed in position over the hatch opening, and by using two electric pier winches and the cargo masts two gangs can be worked per hatch. By the use of this method drafts can be swung through the doors of the transit shed and thus be landed under cover, which is impossible for ships with short booms. By utilization of the cargo mast and dock winch, it is often possible to keep working a hatch during a light rainfall.

Pier 8 is of the same type of construction as are the others. On the upper side it has a length of 1028 feet and on the lower 990 feet. The transit shed is 870 feet long and 172 feet wide, leaving an apron about 18 1/2 feet wide and an open storage area of approximately 16,825 feet on the offshore end. The transit shed, which is bisected by double depressed railroad tracks down the center, has

a total capacity of 140,000 square feet. The berthing space is 2275 feet with 35 feet of water. The superstructure on the transit shed is fixed and does not overhang the apron as does that on Pier 7. The cargo mast is set at a height of about 75 to 80 feet above low water. (The tides at Cristobal vary from one to two feet.)

On the edge of the shed and extending its entire length, steel masts carrying a girder. A block and tackle with a line from a drum hoist on the pier to the hook is attached to this girder by a shackle bolt and stirrup. A ship's boom and hoist also operate another line to the same hook, and thus the ship's tackle and the pier tackle work in unison.

In handling cargo by the combination of ship's boom and winch with the dock winch and cargo mast, all movements are made without any lost motion and by the shortest possible route. Cargo masts and dock winches are particularly useful in transferring heavy packages from the ship, and even from the transit shed, to open-top cars spotted on the wharf apron.

Track on Each Apron

Pier No. 8 has a single floor level track on each apron. On all of the piers these tracks are placed fairly close to the water, there being a clearance of about six feet between the offside rail and the stringpiece. Since one of the most important objects of ship-side car tracks is to facilitate the transfer of heavy or bulky materials between cars and ships, it is necessary that the tracks be sufficiently close to the water to permit the ship's outboard booms being placed at the most efficient working angle. Although the cargo masts on Pier 8 provide an excellent medium for berthing cargo, the tracks are placed close enough to the water to permit booms of the average length to plumb the center line of the cars.

The double depressed center line tracks cut the transit shed on Pier 8 into two separate sheds as far as working cargo is concerned. These tracks have a total capacity of 42 cars. Both passenger and freight cars of the Panama Railroad Co. are spotted on these depressed tracks, and thus passengers and cargo are discharged from the ships to the cars. Freight cars can be spotted with their doors opposite so that the far cars may be loaded by trucking through the car next to the platform on which the cargo has been collected. This system may also be used as a bridge, tractor-trailer trains driving right through both cars. Portable ramps can also be quickly erected, thus affording access to all parts of the entire shed with a minimum of back hauling.

Ships of the Panama Railroad

Steamship line upon arrival at the canal, dock at Pier 8 with passengers and freight for the Canal Zone and the Republic of Panama. After the passengers have left the terminal, the freight is discharged and loaded into box cars spotted on the double depressed tracks. When the ship has completed unloading, it is warped across the slip to a loading berth at the offshore end of pier 7. Here freight, properly assembled for the northbound voyage, can be loaded at a rate limited only by the speed of stowing in the holds. As far as is practicable, all freight destined for the vessels calling at the terminals, is kept on skids and thus it can easily and quickly be brought to the ship's side when the vessel is ready to load. When insufficient cargo is taken to warrant the expense of shifting the vessel to a loading berth, the freight is brought to the vessel by tractor-trailer trains, etc.

Fifty-Ton Derrick

The offshore end of Pier 8 is equipped with one stiff-leg derrick of 50 tons capacity, which is used for handling heavy lifts. Instances have occurred in which this derrick lifted double its rated capacity.

Pier 8 is also equipped with 24 fuel oil outlets, which makes possible the bunkering of ships while loading and discharging. In addition, this pier has been provided with one part 12-inch and part 10-inch diesel oil pipe line, having 13 outlets on the pier. Only one vessel can be oiled through this line at a time.

Wharf No. 9 is 1068 feet long and 75 feet wide from the stringpiece to the edge of the one depressed track in the transit shed. This wharf offers 1080 feet of berthing space in 38 feet of water. The transit shed has a capacity of 82,200 square feet. The apron on this structure is 22 feet wide and carries one floor level track. Parallel to the wharf there is an annex building which is used for the storing of mail and baggage, local freight, short shipped freight, and general cargo.

The superstructure on the wharf is of the same type as that on Pier 8. Between the depressed track on wharf 9 and the wall of the annex, which has doors cut into it at suitable intervals, there is a platform 14 feet wide, which arrangement makes the cars on the depressed track readily accessible from both sides. Wharf 9 has no fuel oil lines.

At Cristobal every effort is made to get ships underway in the shortest time possible. By so doing, the terminal is able to handle more ships in a given time with less cost per ship and yet with greater revenue to itself. Proper application of the principles of modern terminal management have made this port an outstanding example of efficiency in despatch of vessels.

Passenger Travel Increase for Italian Line

The SATURNIA of the Italian line arrived in New York, March 26, from Adriatic and Mediterranean ports. She sailed from New York the next day on a Mediterranean cruise touching at the Azores and Lisbon, with every first class cabin occupied, and a total of 800 passengers.

The Italian liner REX, arriving from Naples, Genoa, Nice, Gibraltar and Mediterranean ports, docked in New York, March 28, with a season record passenger list of 1446, and departed for Gibraltar, Naples, Nice and Genoa on March 30.

A large passenger list was also carried by the CONTE DI SAVOIA of the line when she arrived at New York, April 11, from a Mediterranean cruise, having stopped at Naples, Genoa, Nice and Gibraltar. She arrived with 1333 passengers.

According to Aroldo Palanca, general manager of the Italian line for the United States and Canada, the outlook for transatlantic travel this year is decidedly encouraging. From advance bookings for the spring and summer, the company's carryings for 1935 should far exceed those of last year.

The Italian line has already noticed a marked upturn in business. Mr. Palanca points out that a gain of more than 1000 passengers is shown in the number carried by the company's vessels during January and February this year over the number carried the first two months of 1934. The number of passengers handled in March also showed a gain over March of 1934. During the first two months this year, Italian line vessels operating between New York and the Mediterranean carried 4766 eastbound passengers and 4073 westbound, as compared with 3711 eastbound and 3821 westbound in the first two months of 1934.

The most encouraging feature in this increase, according to Mr. Palanca, is that most of the gains were in the more expensive quarters.

Safety Record at Bath

Walter J. Brennan, safety engineer of the department of labor and industry of the state of Maine, awarded the Gov. Louis J. Brann trophy to the Bath Iron Works Corp., Bath Me., for making the best progress in accident prevention in the state, all phases considered, during the year 1934.

Of 687 average number of employees working 1,177,031 hours, only 1488 injuries of all types were listed. First aid was given to 1287; and 201 were cases sent to a doctor. There were only 12 lost-time injuries, with 251 days lost.

The percentage of hours lost to

hours worked for the years 1930 to 1934 inclusive were as follows: 1.018 per cent; 0.905 per cent; 0.638 per cent; 0.147 per cent, and 0.110 per cent.

At the time these figures were compiled, Bath Iron Works was engaged in building destroyers.

Set New Travel Records

The QUEEN OF BERMUDA and MONARCH OF BERMUDA, cruise liners of the Furness-Bermuda line, plying between New York and Bermuda, have established new travel records between these two points, according to James M. Findlay, passenger traffic manager of the line.

Mr. Findlay points out that from March 23 to April 6 these two liners made a total of seven sailings from New York and took out 4688 passengers to Bermuda. The MONARCH OF BERMUDA, in four sailings from New York, carried 2788 passengers; while the QUEEN OF BERMUDA, in three, carried 1900 passengers.

To Hold Essay Contest for High School Students

In connection with the celebration of national maritime day, May 22, the Propeller club of the United States is conducting an essay contest for students in the high schools of the country.

The title of the essay in this contest is to be, "Why the United States Requires a Merchant Marine for its Domestic and Foreign Commerce." The essays submitted must not be more than 2000 words in length. The names of the writers of the two best essays submitted by high school students in each locality will be announced on national maritime day, May 22. The two winning essays from each section are to be forwarded to the national headquarters of the Propeller club of the United States, not later than June 1, where they will be entered in a nation-wide contest and the winners of the national prizes will be selected by a board of judges.

Names of the winners of the national competition will be announced as soon as practicable after June 10. This contest offers prizes which provide a variety of interesting summer vacation trips.

Local Propeller clubs in co-operation with leading newspapers in their communities will make announcements concerning this contest in various sec-

The Pittsburgh office of The Penton Publishing Co., publisher of MARINE REVIEW, has been moved from 507 Oliver building to 1650 Koppers building.

Accident Prevention

(Continued from Page 27)

4. Violation of safety rules.
5. Physical fitness, etc.
6. The tolerated unsafe habits of workmen.

Safe Way Is Best Way

Needless to say, when any accident prevention program is instituted, its very newness may make it somewhat unwieldy. However, as the safety work progresses the regular work gradually flows into the channel of the safety plan, as it were. The truth of the matter is, that the safe way is the proper way of performing any work.

When accidents are rampant, improper working procedures generally are being followed. Naturally, any accident preventive effort will materially alter working procedures. The change, however, will be for the better, as will be witnessed by the reduction in injuries, compensation, insurance and other direct and indirect charges. There is also bound to follow an increase in efficiency.

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In accordance with the Trade Practice Provisions of the Code for Periodical Publishing and Printing Industry the following constitutes "Publisher's Statement of Circulation."

This is to certify that the average circulation per issue of MARINE REVIEW for the six months' period July 1st to and including December 31st, 1934, was as follows: Copies sold, 1,451. Copies distributed free, 1,259. Total 2,170. Signed—F. V. Cole (Publisher).

Subscribed to and sworn before me on this 22nd day of March, 1935. H. L. Richey, Notary Public. My commission expires May 7, 1936.

A New Marine Observatory On West Coast

The board of harbor commissioners at Los Angeles harbor, in co-operation with California Institute of Technology are to undertake the establishment of a most complete meteorological marine observatory. Plans for the observatory have been completed and erection of suitable quarters on Terminal island will follow shortly.

Most modern methods in collection of meteorological, climatological, aeronautical and oceanographic data will be installed. These activities will be carried forward in co-operation with navigation and commercial shipping, the navy hydrographic office, the United States weather bureau, the lighthouse service, the coast guard and geodetic survey, the Marine exchange and others. Particular attention will be given to the air mass method of weather forecasting and to fog studies. All data collected and assembled by

the observatory will be available for shipping interests and others interested.

Details of the project were announced by Gerald C. Fitzgerald, vice president of the harbor board, and G. E. Arbogast, commissioner, who as a committee of the board worked out the plans with Dr. Robert Milliken, president of the California Institute of Technology, and Dr. Irving Krick, a faculty member of the Institute, who is one of the world's recognized meteorological experts.

On April 15 the ferryboat RALPH J. PALUMBO, owned by the city of Boston, was sold at auction to the Norfolk County Ferries, Portsmouth, Va., for \$43,700. The PALUMBO was built at Chelsea, Mass., in 1921 at a cost of \$300,000 and is named for an East Boston war hero. Under her new ownership, she will be used in the service between Portsmouth, Va., and Norfolk, Va.

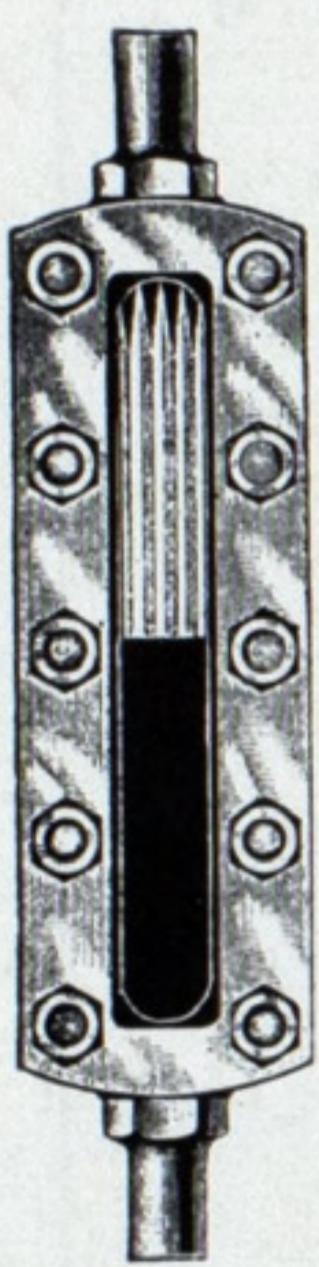
I. M. M. Executive Retires Others Promoted

George W. Cook, comptroller of the Roosevelt - International Mercantile Marine Co., retired from active service on March 30, after forty-six years with this organization.

Mr. Cook began his career in 1889 in the accounting department staff of the International Navigation Co., Philadelphia. Later when this company was absorbed by the present organization, he was transferred to the New York office as an auditor.

At a meeting of the board of directors, Solfest Tomasson was elected comptroller to succeed Mr. Cook. His selection to this office follows twenty-nine years of service with the company, most of which was in the accounting department.

The retirement of Mr. Cook brings promotion to Andrew F. Finch, formerly treasurer, and James C. Anderson, formerly general auditor.



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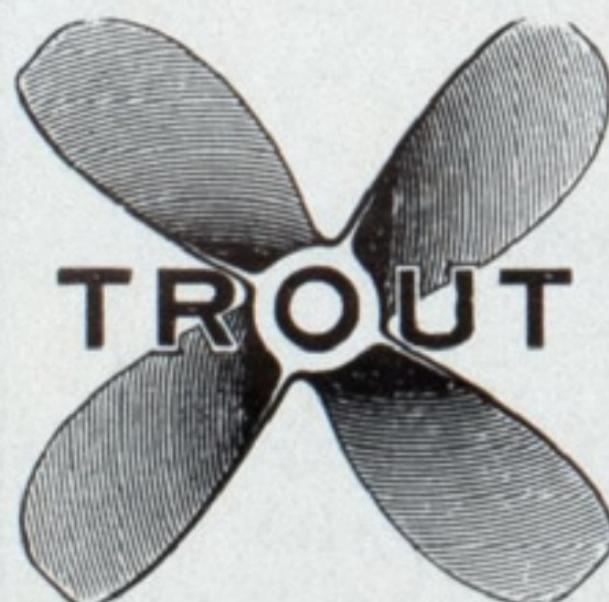
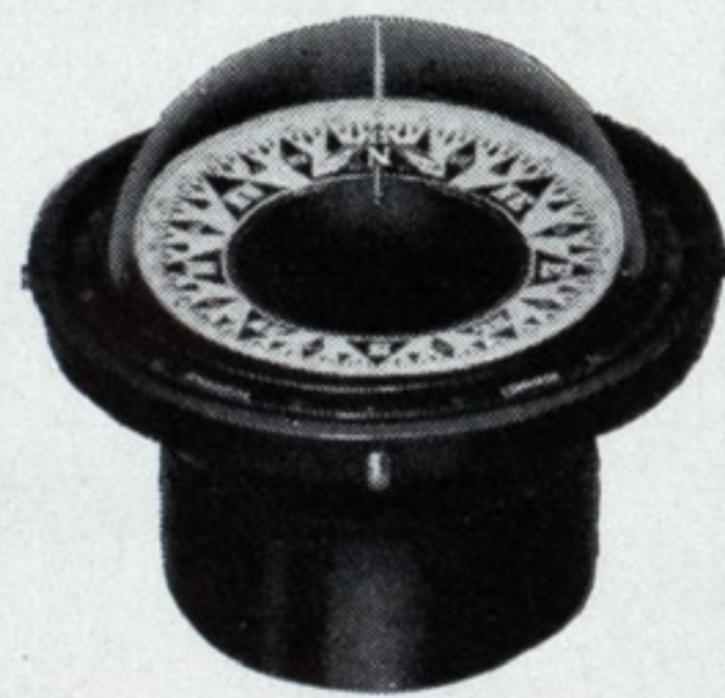
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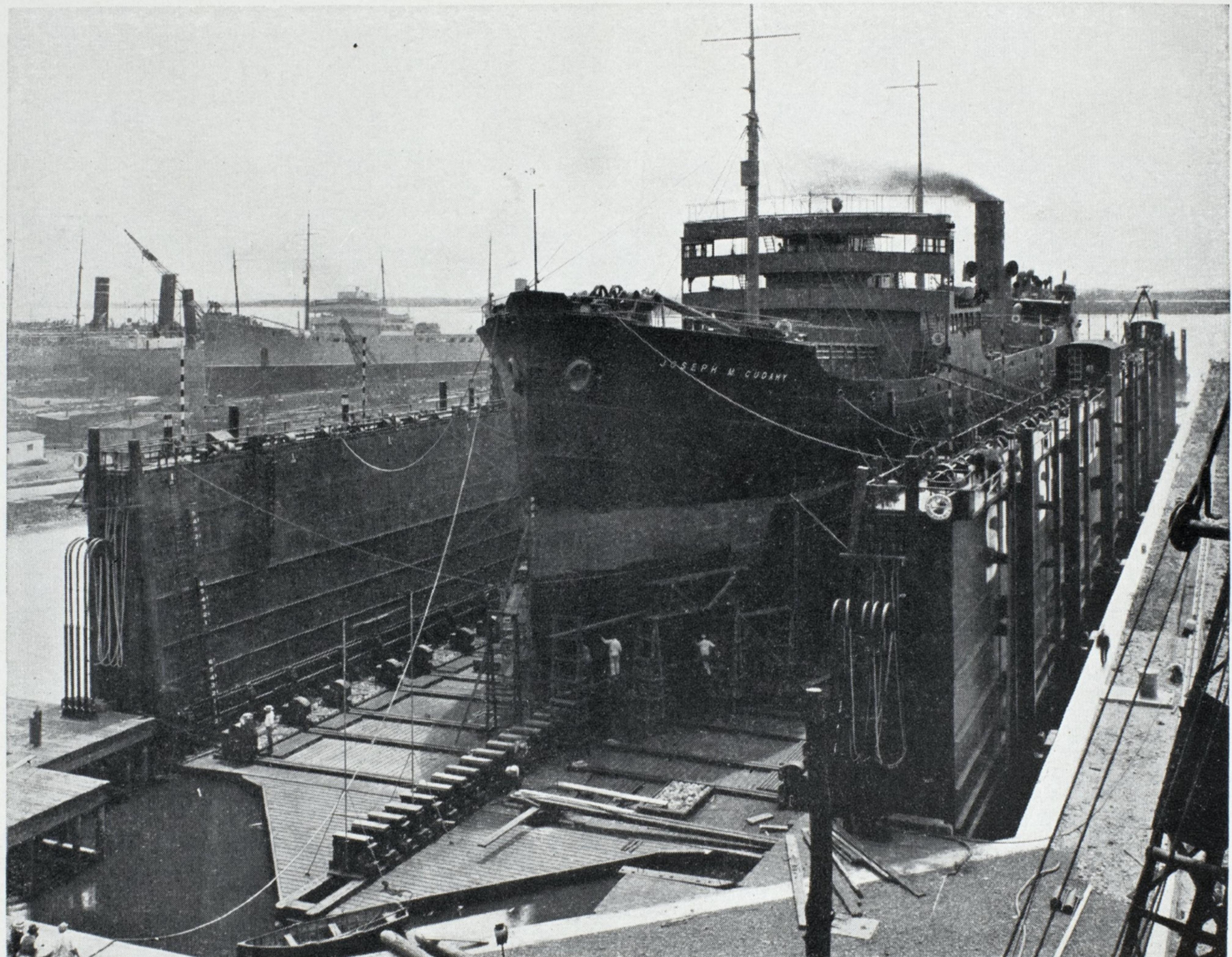


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May 1935

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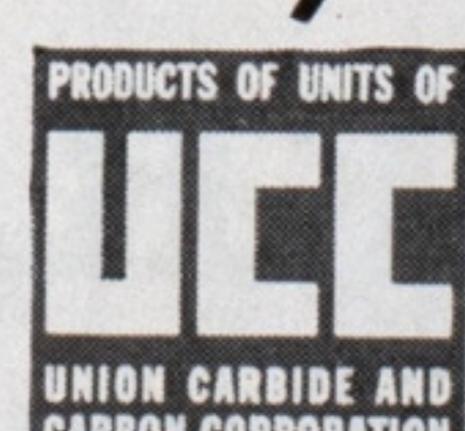
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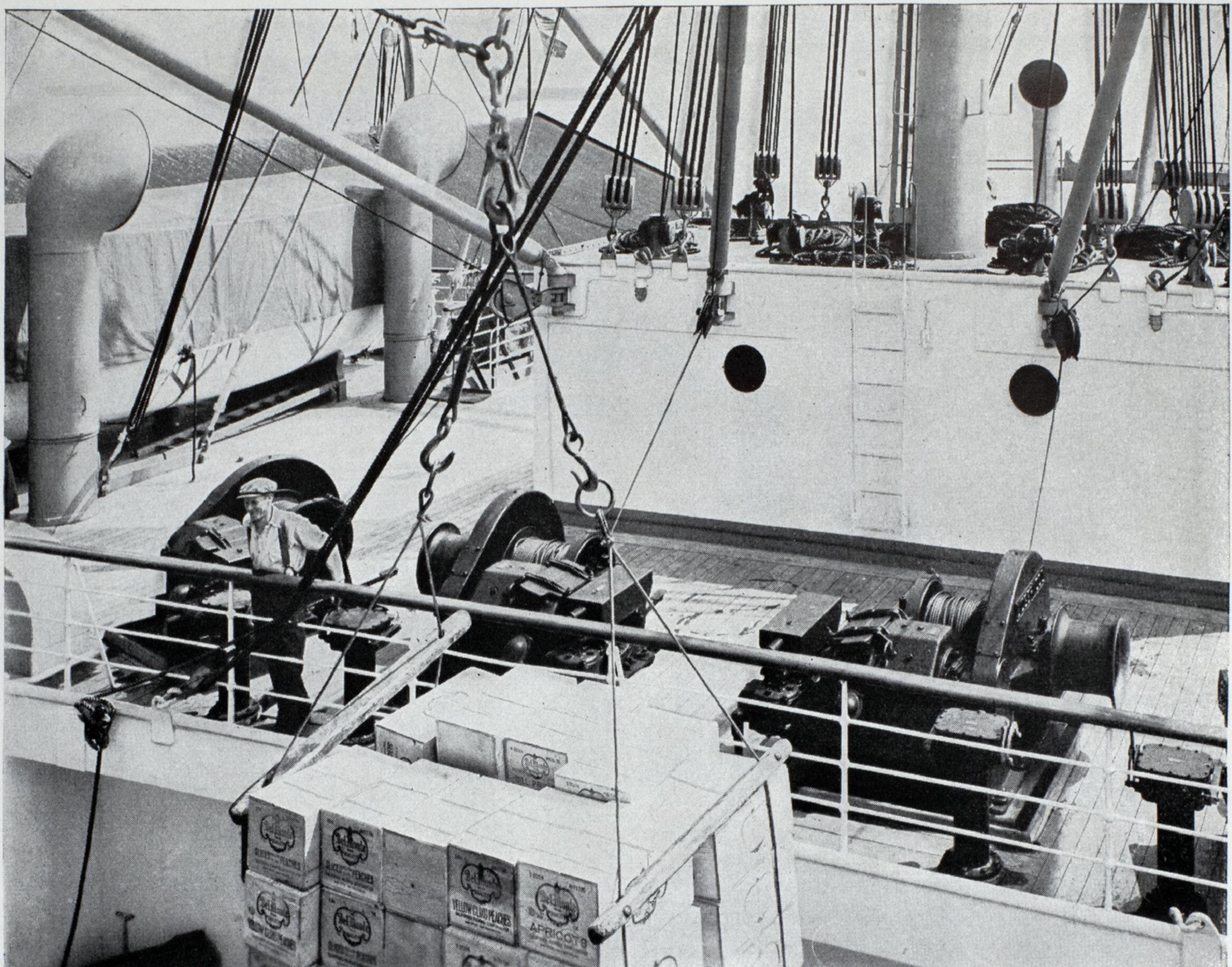
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LINDE

UNION CARBIDE



Electric Winches Speed Cargo Loading

WATCH the stevedore swing cargo aboard with electric winches—up, over, down—fast, safe, sure—with a rhythm that quickly fills the holds. There's nothing strange to him about these modern deck machines, except that he can load faster—and load with greater safety. Less time in port, fewer delayed sailings, low maintenance, less worry for the deck engineer—all these are advantages of electric winches.

General Electric equipment is engineered for marine service. Winch motors are designed for high hoisting speeds, for safe dropping speeds. The control is easy for the stevedore to operate; it always provides smooth acceleration, positive

hoisting, and positive lowering. Dynamic braking stops the load; spring-operated, electrically released brakes hold it.

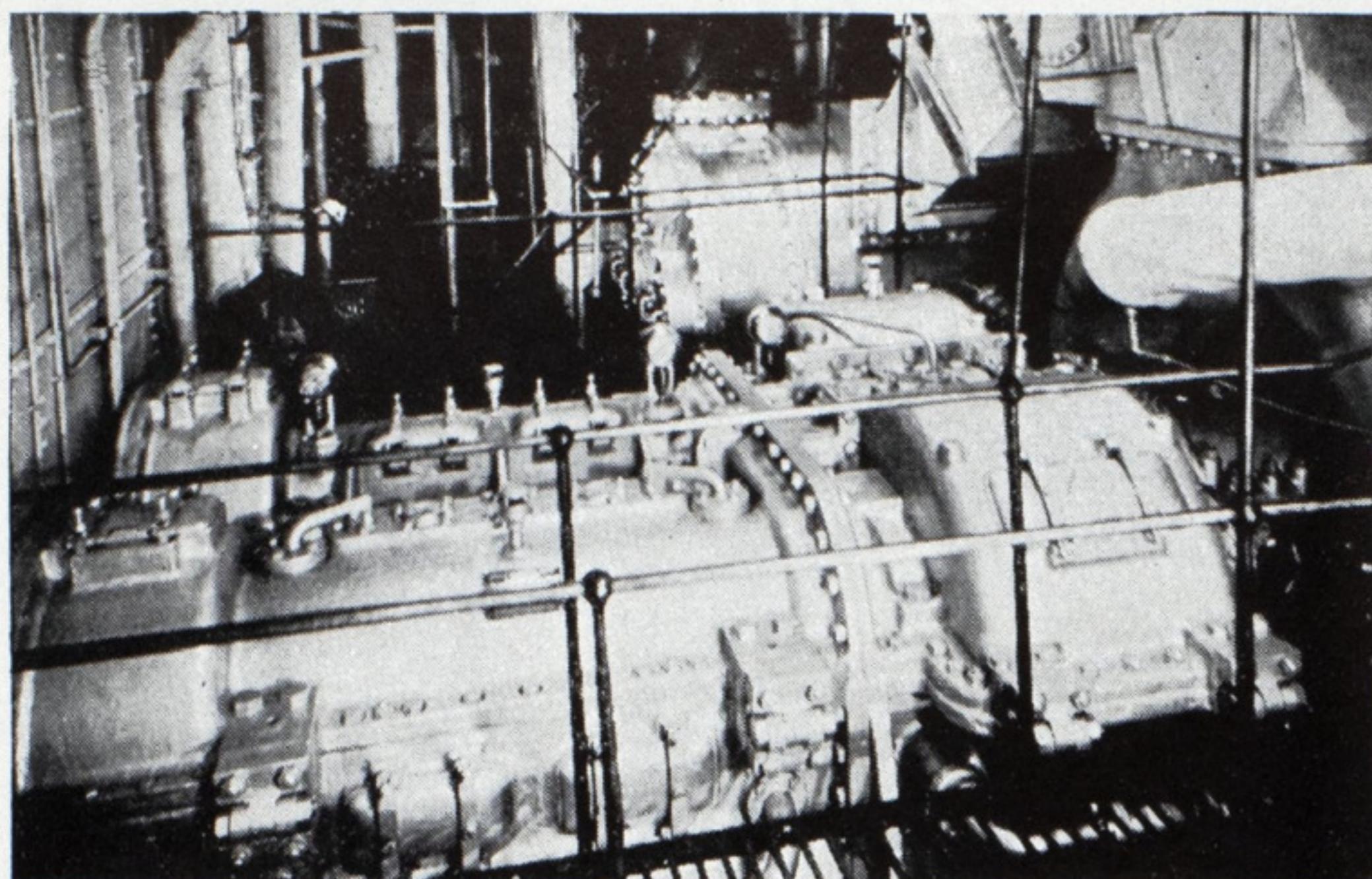
Like all G-E equipment for deck auxiliaries, the motors and control for electric winches are built to stand up under rough handling and sea conditions. The motors are waterproof, the control is foolproof—both are always ready to go.

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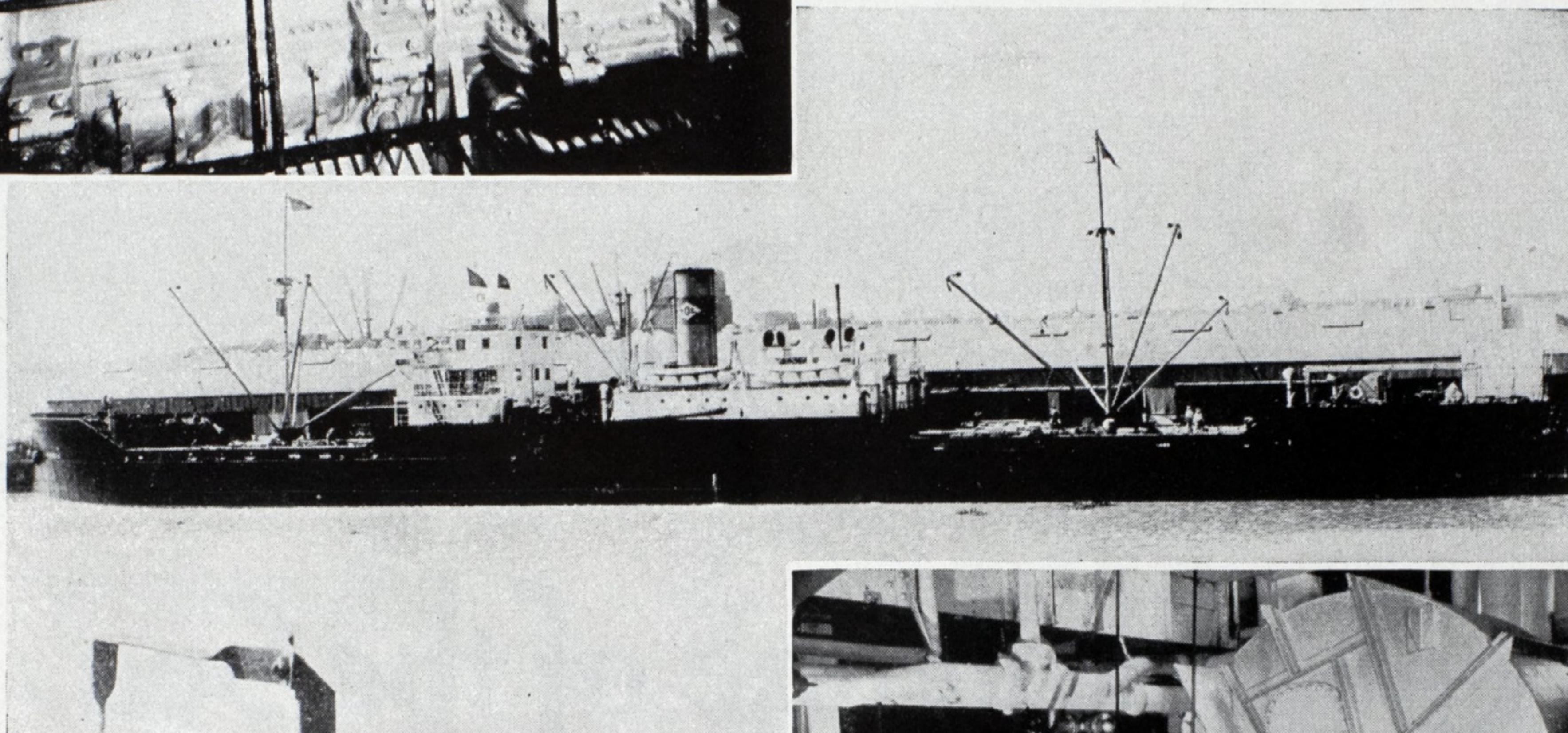
GENERAL  **ELECTRIC**

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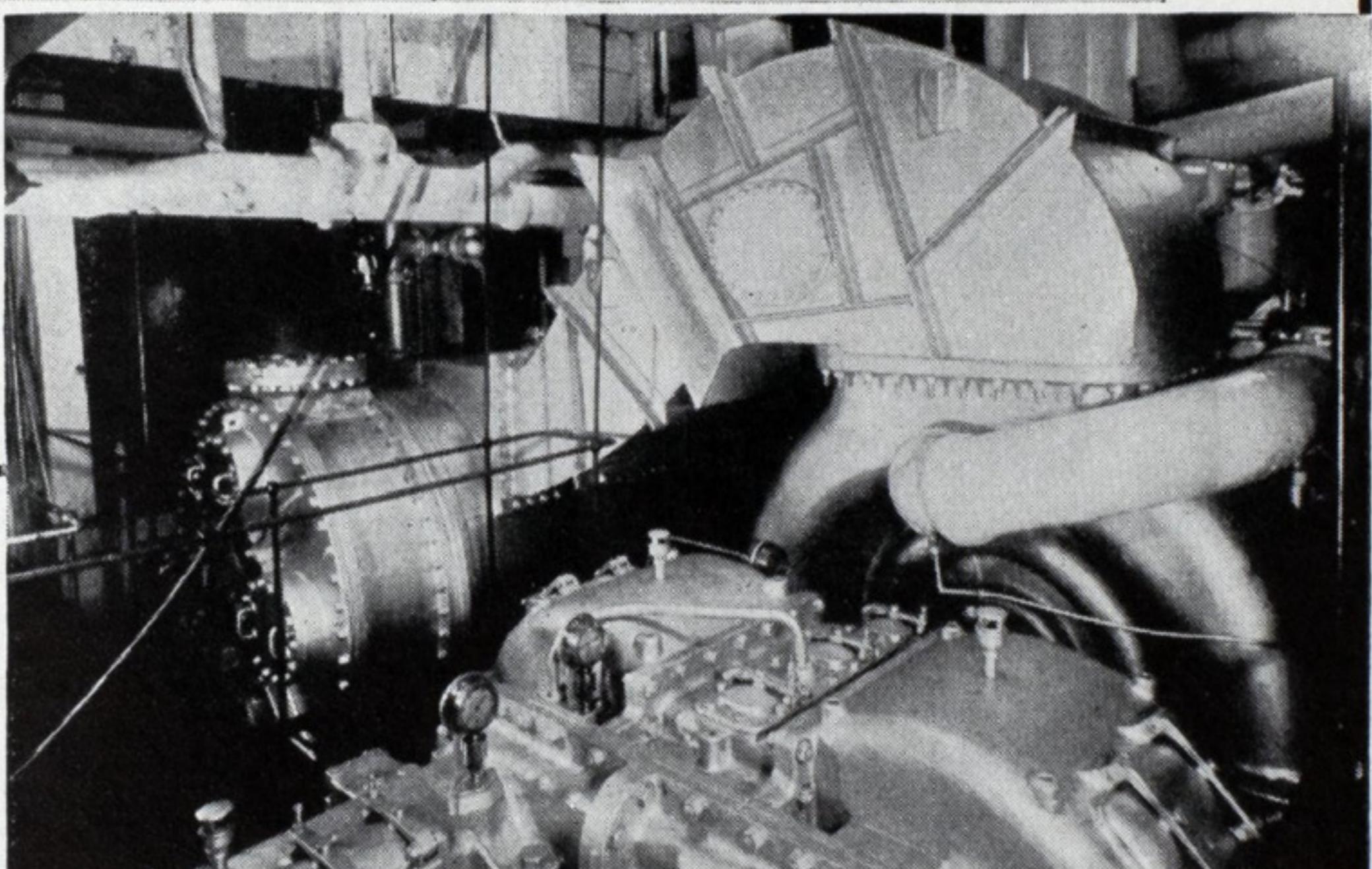


*Freighters on Long Hard Runs
Insure Safe, Low-Cost Operation
with Gulf Lubricants*

At the left is shown the reduction gear driving the main propulsion unit of the Afoundria.



Above is the S. S. Afoundria, one of the Mobile Oceanic line's freighters which plies between the Gulf of Mexico ports and Europe.



Gulf quality turbine oil lubricates both the 3500 H.P. turbine and reduction gear drive, shown at right.

"WE USE Gulf lubricants for safety and reliability," that is the statement of the management of the Waterman Steamship Corporation. And that is the paramount consideration of many other shipping lines when they select Gulf lubricants for their equipment.

Gulf quality lubricants for Marine Service give that extra margin of safety which ships on long hard runs require. Gulf engineers assist in the selection and application of the most suitable oils and greases for each moving part.

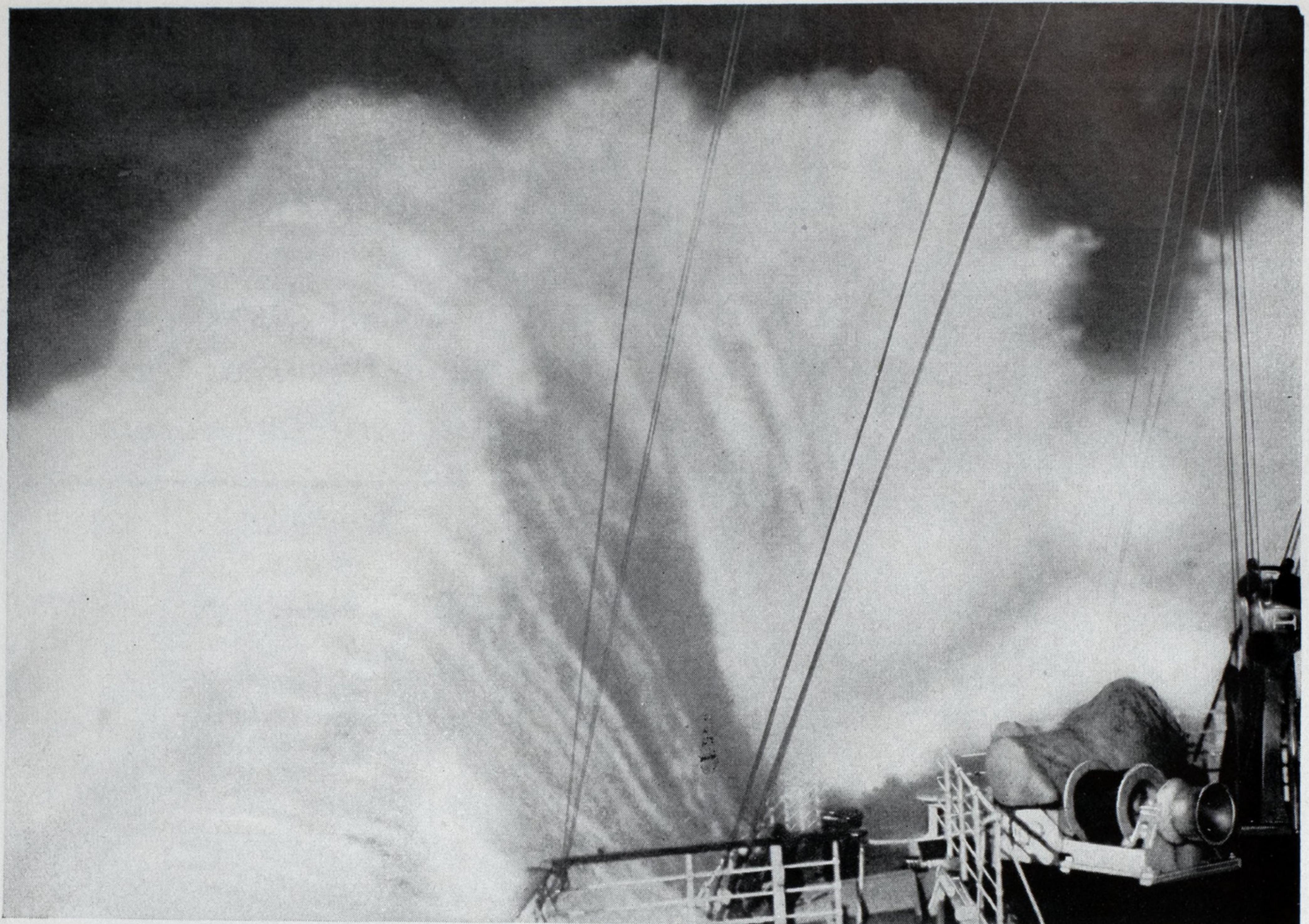


Included in Gulf's complete line of lubricants are oils manufactured by the famous ALCHLOR process, patented and owned exclusively by Gulf. These unparalleled lubricants will give you the lowest possible operating costs. Give them a trial.

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The Challenge of the Sea

OLD NEPTUNE is an antagonist difficult to outwit. He has ways of showing up workmanship that are the envy of the most searching, critical inspector.

The way to get the better of him is to have ships put in condition by men who think in terms of seas sweeping over the forecastle, of propeller blades pounding the water as they plunge beneath the surface, of engines alternately idling and straining to the limit as the ship bucks the winter gales with its wheel in the air half the time.

In Bethlehem Ship Repair Plants vessels get this kind of attention. Every task, large or small, whether it be fitting a valve stem or installing a new turbine rotor, is handled with full recognition of the vital role the part may play at some critical time. Scrupulous care is exercised to turn out work that measures up to the high standards set for survival of the sea in its most truculent moods.

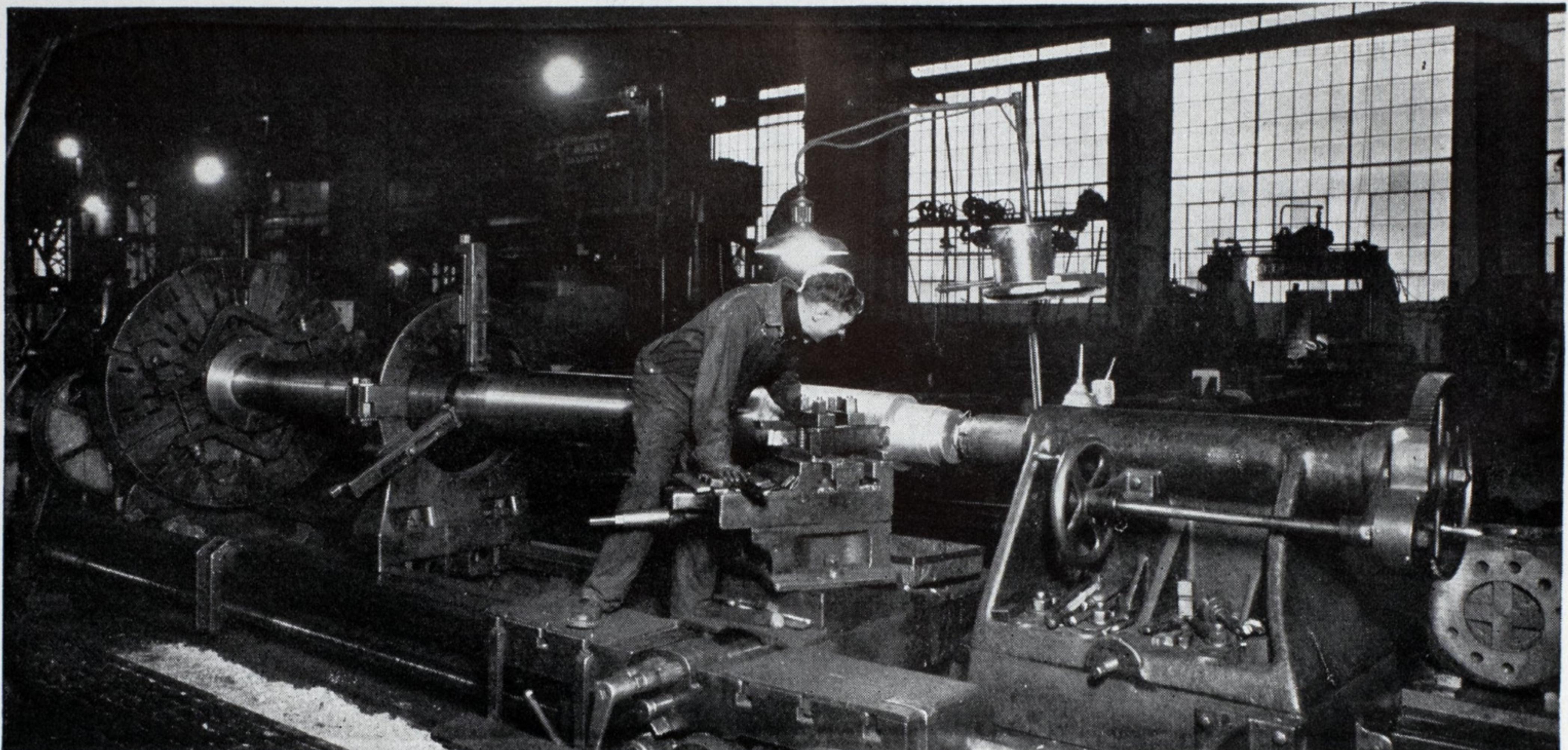
At Boston, Baltimore, San Francisco and San Pedro, Bethlehem Plants offer ship-repair service that equips vessels to meet confidently the challenge of the sea.



BETHLEHEM SHIPBUILDING CORPORATION, LTD.

General Offices: Bethlehem, Pa. *General Sales Offices:* New York, San Francisco. *District Offices:* Boston, Baltimore, San Pedro. *Ship Yards:* Fore River (Boston), Sparrows Point (Baltimore), Union (San Francisco). *Ship Repair Yards:* Boston Harbor, Atlantic and Simpson Works; Baltimore Harbor, Baltimore Dry Docks and Sparrows Point Works; San Francisco Harbor, Potrero, Hunters Point and Alameda Works; Los Angeles Harbor, San Pedro Works.

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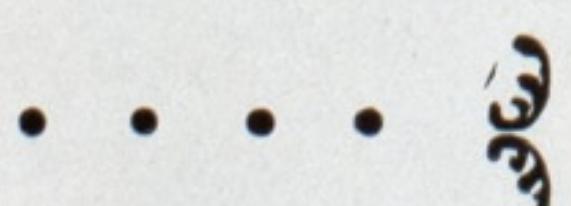


This picture gives concrete evidence of American Ship's ability to serve ship operators and owners.

But the big lathe shown forms only a small part of American Ship's complete ship building and ship repairing facilities. We are equipped to dry dock and repair vessels; to build and repair boilers and engines; in fact, to perform any one of the scores of other repair jobs a ship may require.

All of these facilities are constantly available to you, at five convenient locations, to bring you swift, dependable, efficient service.

The AMERICAN SHIP BUILDING CO.



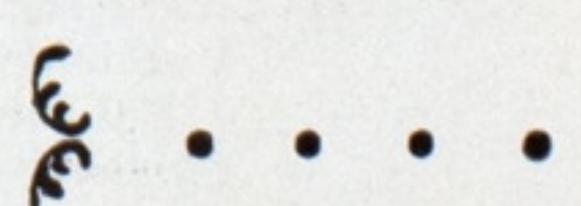
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Superior Ship-
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Greater dependability and economy with the Exide Marine Floating Battery System

With the Exide Marine Floating Battery System, the battery is floated on the main bus and kept charged at all times. It helps to carry all peak loads, and automatically assumes the entire electrical auxiliary load in case generators fail for any reason.

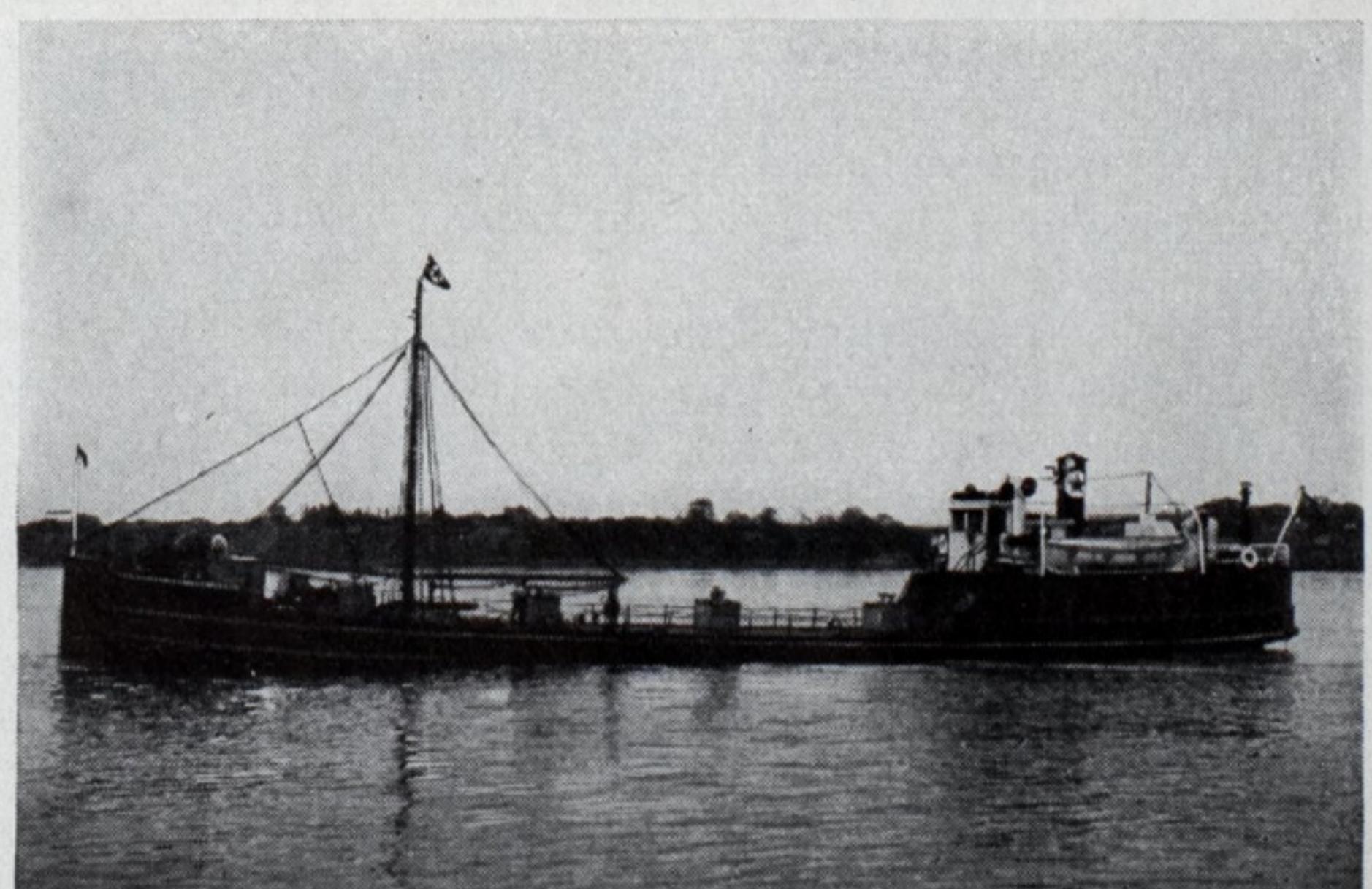
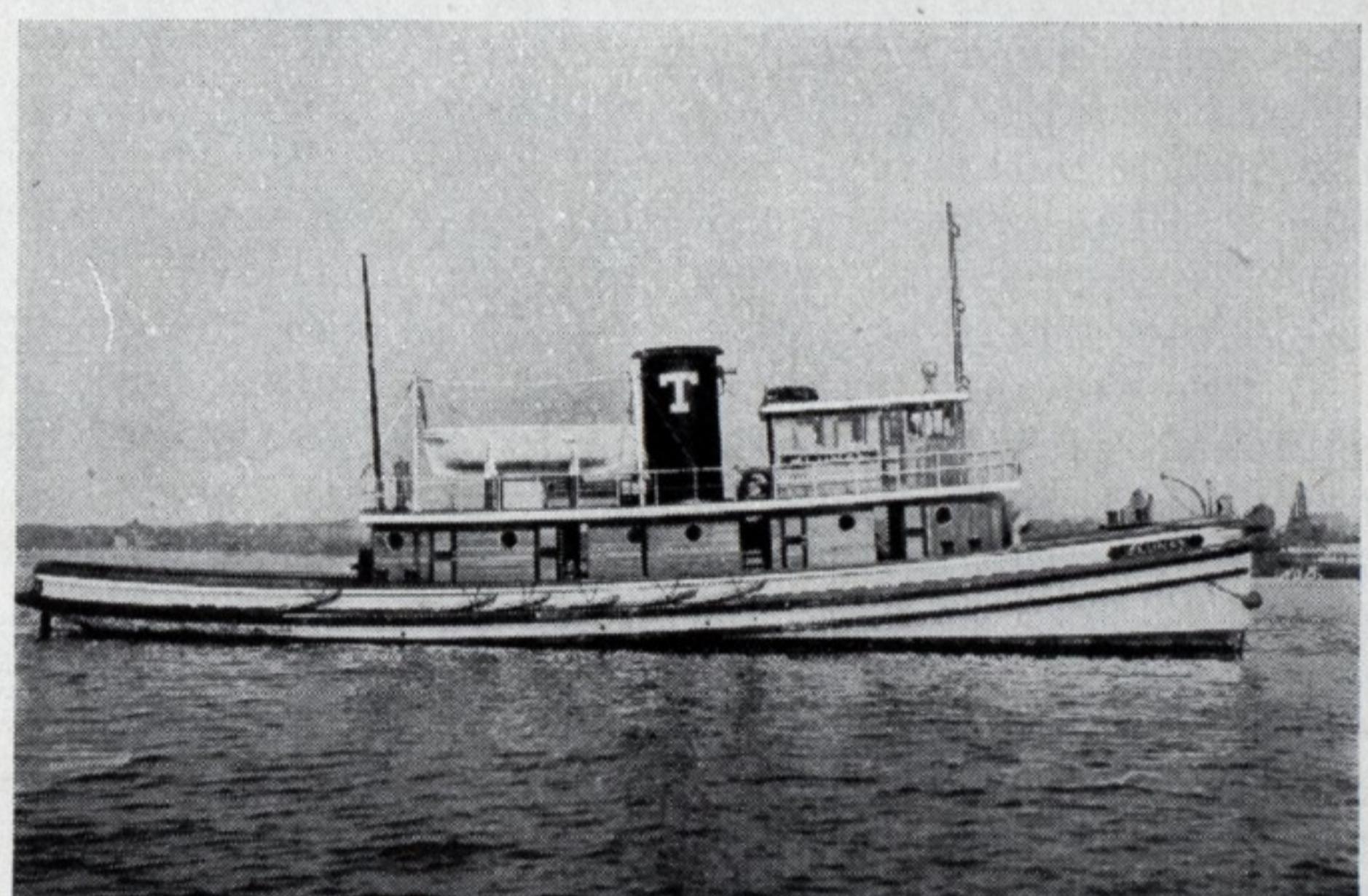
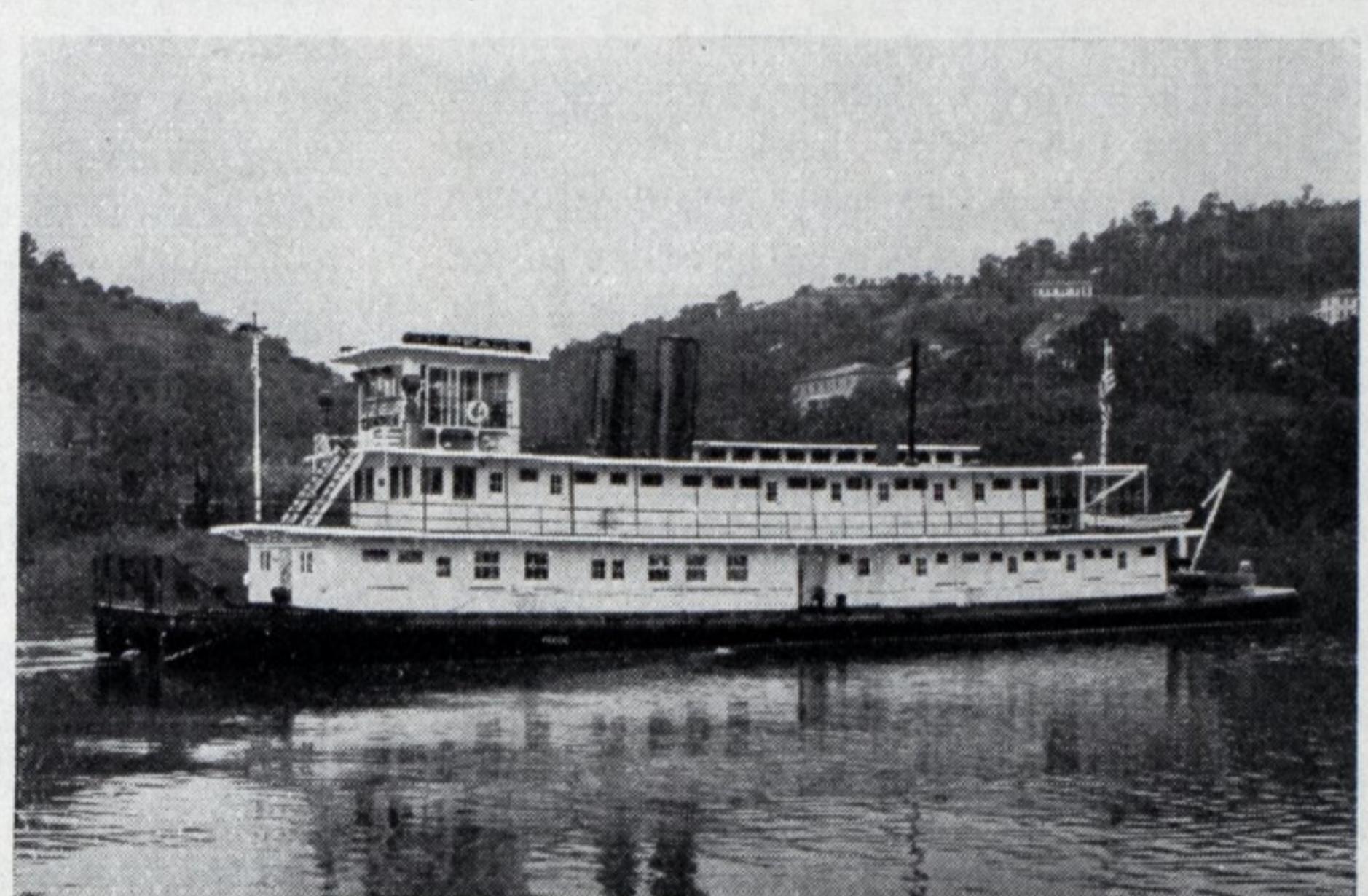
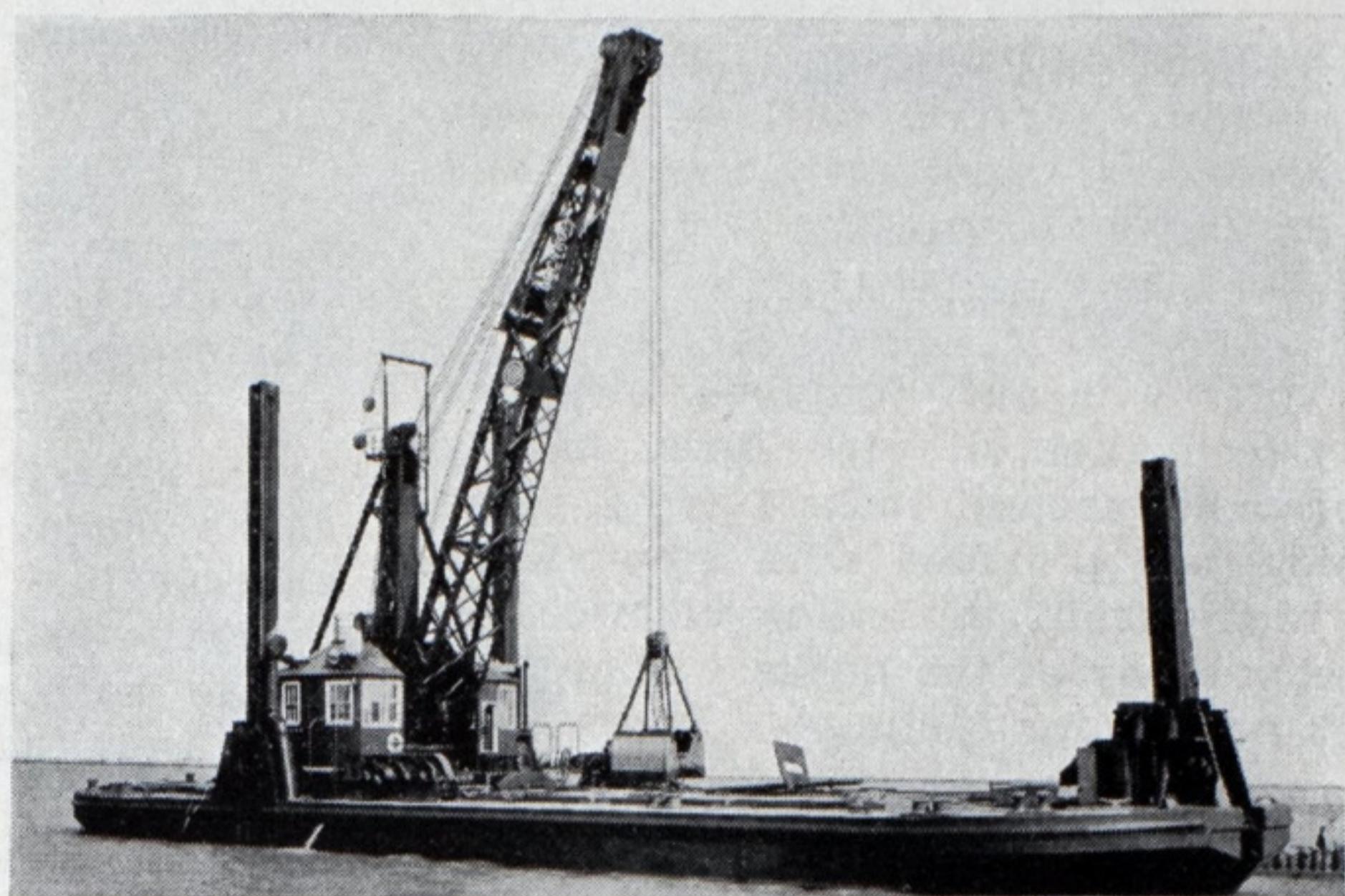
If it is desirable to shut down generators temporarily, the battery takes over the load without the use of switches or relays. By relieving generators of peak loads, the Exide Marine Floating Battery System permits the use of smaller generator units, making a substantial saving possible.

It is easily seen that the system offers utmost reliability. This feature, as well as the use of Exide-Ironclad Marine Batteries, not only reduces all kinds of trouble to a minimum but insures definite economies.

Why not cut costs with Exide? There is a long-life Exide Battery for every size of craft and type of installation. Write for booklet, "Exides for Commercial Vessels."

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The World's Largest Manufacturers of Storage Batteries for Every Purpose
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Exide
IRONCLAD
MARINE BATTERIES
WITH EXIDE MIPOR SEPARATORS
"MIPOR," Reg. U. S. Pat. Off.





The Mold Loft

THE "template" system permits the fabrication of steel even before the keel of a ship is laid.

These "templates" or patterns are made in the Mold Loft, shown above, 725 feet long, 92 feet wide. The floor, of matched pine strips, is a gigantic drawing board.

The Loft occupies the entire top floor, indicated by an arrow in the view below.

This system was developed by the founders of the New York Shipbuilding Corporation. It is now in world-wide use.

It assures accurate fabrication and handier assembly of steel shapes and plates into a hull.

The Mold Loft, with its attendant efficiencies, is one of many pioneering contributions by NYS to the shipbuilding arts.

NEW YORK SHIPBUILDING CORPORATION

Camden, New Jersey, U. S. A.



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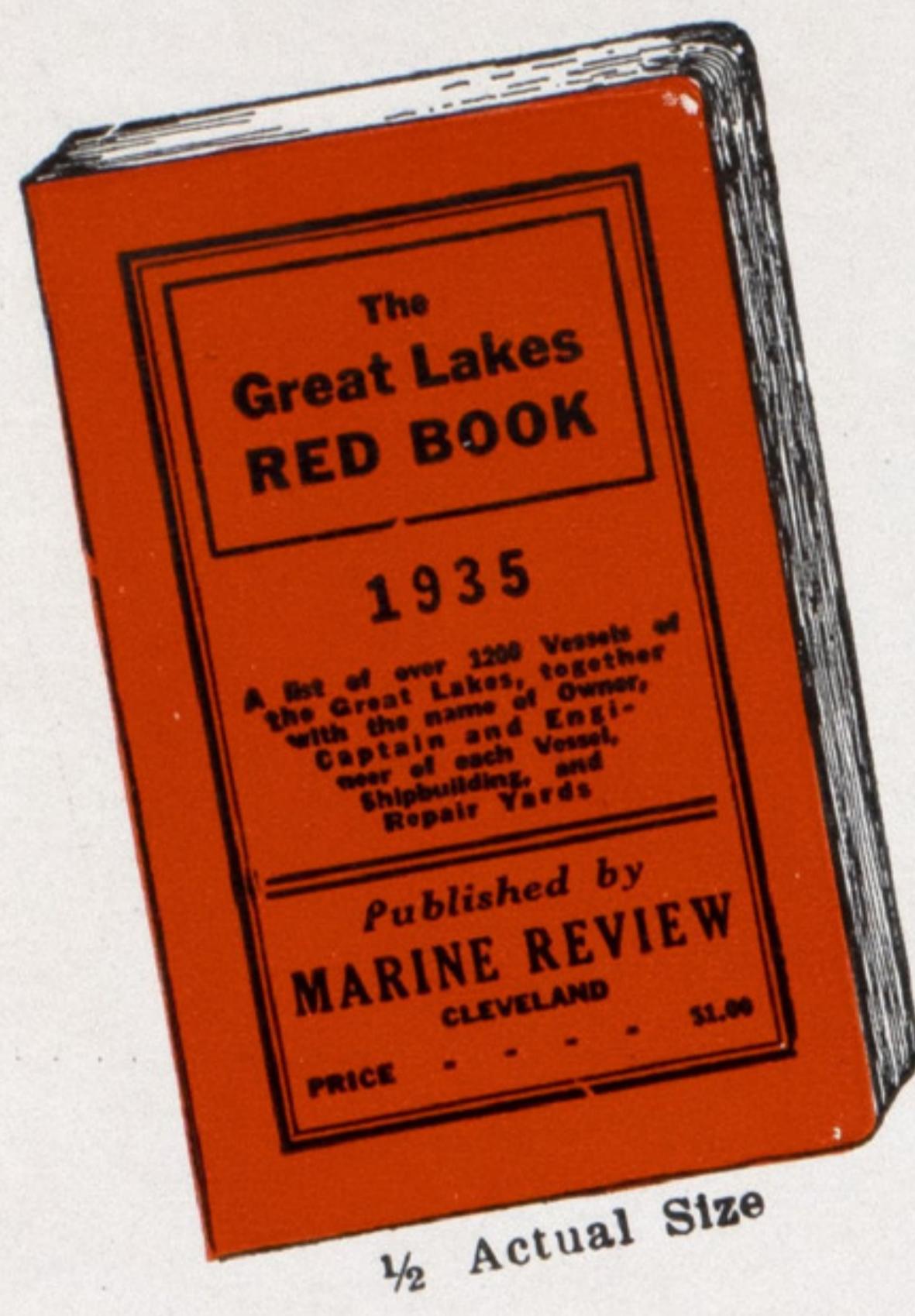
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